

WrapSheet

Your Guide to Marketing to Information Executives

Enter to win the
KEYS TO SUCCESS
SWEEPSTAKES

—see page 4 for details

CIO Executive Programs Attract Fujitsu's Target Audience

When CIOs attend conferences, a top priority for them is to network and learn from their peers—which translates into an active and engaged audience of IT executive decision-makers. This environment provides a valuable opportunity for IT marketers to educate and learn from this elusive target audience.

In order to capitalize on event investments, marketers need ensure the program offers a balance of peer learning and networking opportunities. Well-run, high-level events which match the audience's needs will attract the highest-level executives, ultimately translating into engaged participants with large IT budgets.

"CIO Executive Programs attract IT thought leaders who attend for compelling content and peer interaction. By being a sponsor we ensure that our company is

viewed as a resource to a powerful buying community. It's this affiliation with a respected brand like *CIO* that makes a difference in our ability to reach buyers and more importantly, really

It's this affiliation with a respected brand like *CIO* that makes a difference in our ability to reach buyers and more importantly, really get to know them.

get to know them." says Dennis Mull, Senior Vice President of Sales for Fujitsu PC Corporation.

By producing executive events that are topically relevant, educational and informative, CIO Executive Programs attract high-level attendees that match our sponsors' core target audience. CIO Executive Program sponsors have access to IT decision-makers from the nation's corporate, private and public sectors in an environment that fosters education, peer interaction, and relationship building essential to their success moving forward.

"Sponsoring such programs as the CIO-100 Symposium and Awards enables us to meet with *CIO* readers in a setting that allows us to reaffirm existing relationships, and create valuable new

ones with senior prospects we might not otherwise meet." says Mull. "We get to really know our customers, and better

understand their individual needs and concerns.

In this context, we can be more effective in educating them on our latest product offerings at a peer executive level.

The result is that our customers and prospects effectively integrate Fujitsu products into their overall IT infrastructure and business model. By maximizing the capabilities of our products, they see a return more quickly and most times at a higher level than expected."



CIO Executive Programs provide sponsors with the right audience in a relaxed, learning environment—the ideal venue to strengthen relationships with existing customers and prospects. For more information go to www.cio.com/conferences or contact John Amato at 508.935.4487 or jamato@cxo.com.

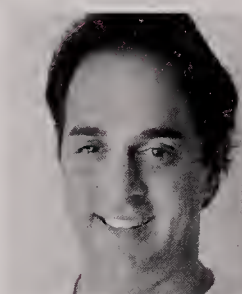
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Q&A

With John Amato



With event marketing investments comprising a larger portion of marketing budgets each year, we sat down with John Amato of CIO's

Executive Programs to find out how IT marketers can leverage face-to-face events for the greatest benefit.

Q. With the variety of events available to IT marketers, what selection criteria can be used to best match events with marketing and sales objectives?

A. Events should be evaluated on whether they meet your target audience's information needs. Is the content relevant to IT decision-makers? Are speakers well-known thought leaders, but not over-exposed? In addition to evaluating content, it's important to choose events where the attendees have prior knowledge of

your company. It is not the best use of your event marketing investment to be at the first step of the sales cycle—awareness—at a face-to-face event. Research shows that awareness is best built through an advertising program to this same audience. By using a fully integrated marketing program you can build on existing relationships and brand awareness, and hit the ground running at events by generating leads and shortening or closing the sales cycle.

Q. How can sponsors best prepare for upcoming events and participate to make the most of their investment?

A. It is so important to have a full understanding of the event venue and content, level of attendee, and existing mind-share. Work closely with the producing company to become familiar with the venue to take advantage of all it has to offer. Also, be aware of all on-site marketing opportunities so you won't be under prepared or overshadowed by other sponsors' efforts.

Familiarity with event content will allow you to gear your information delivery to suit your audience. Sending knowledgeable, high-level staff who can relate to the audience on a peer level is essential at an executive-level event. Understand how

your audience wants to receive information—they go to conferences to learn new things so adopt an "educate" approach, rather than a "hard sell" mentality.

Pre- and post-event advertising to the event audience is essential. A face-to-face event with a publication's audience brings them to life. They have become aware of you through advertising in the publication, you've enhanced that relationship through one-on-one dialogue and it is essential to continue that relationship with post-event advertising. They will view your marketing message through a new lens after their event interaction.

Deepen relations with key customers and prospects by inviting them to attend the event. Not only will you have a captive audience for the duration of the conference, you will align your brand with the credibility of a prestigious industry event.

Q. How can sponsors measure the ROI of their event investment?

A. We all know that in today's economy, measurable ROI is essential for any marketing investment. But the bottom line may be that even with an economic recovery, we are all going to be held more accountable for our investments.

Continued on page 3

CIO Reader Profile Study

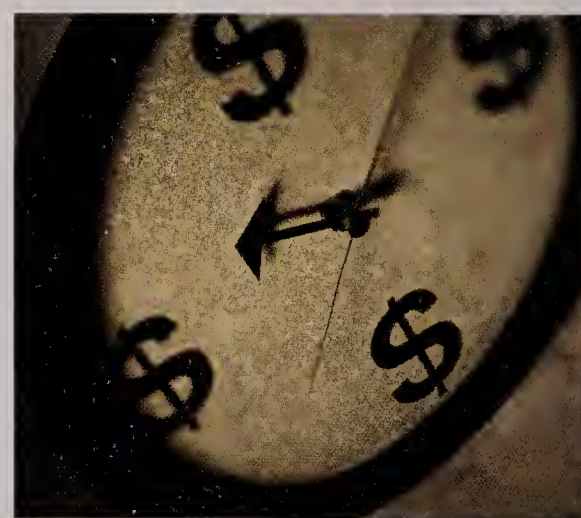
Time is a CIO's most precious commodity—and they don't give it up lightly! Who are the IT executives spending valuable time reading *CIO* magazine? And how much time do they devote to it? The *CIO* Reader Profile Study, conducted each year, finds the answer to these questions, and much more, including readers' involvement in technology purchase decisions, and information on their organizations. Here are some highlights from the 2002 study.

CIO Readers and Their Organizations
CIO subscribers represent the highest

level of technology decision-makers across all functions in their organizations. 63% of *CIO* readers are among their organization's IT management level or higher. The remaining 37% are technology influencers in other corporate departments. Nearly half (42%) are members of their organization's executive committees.

CIO Readers at a Glance

IT budgets: \$180M
Company Revenues = \$7.1 billion
Number of Employees = 19,400
Number of IS Employees = 975
Number of IS Locations Worldwide = 30



The average installed base of a CIO reader's organization has:

8,900 Desktop PCs
6,481 Workstations
2,288 Laptops
489 Servers

Continued on page 3

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CIO.com

CIO

The Magazine for Information Executives

FUTURE TECH

Petabytes of Data:
New Opportunities,
New Problems

Page 80

MARKET WARS

Discount Retailers
Go After Groceries,
Supermarkets Fight
Back with IT

Page 86

GOOD STUFF CHEAP

How to Use the Secondary Market
to Your Enterprise's Advantage Page 52

Bill Haser, CIO of Tenneco Automotive,
is saving a bundle by buying used gear
to support an SAP upgrade.



“Are we secured against that?”

Anything can happen to your infrastructure. Make sure it's secure. The evolution of the Internet has led to increased security vulnerabilities for any Internet-enabled company. In this difficult and challenging environment, where _____ can happen at any moment, Microsoft understands that you need to keep your infrastructure prepared for anything and everything by getting it secure and keeping it secure. Here's what we're doing, along with our industry partners, to help right now:

Security for your existing Windows-based environments

Microsoft is providing tools, services, and guidance to help you get and stay secure right now. For example, tools such as Microsoft® Windows® Update, Microsoft Software Update Services, and Microsoft Systems Management Server are helping customers control and automate the identification, collection, and application of security patches today. Plus, our Security Response Center is staffed seven days a week to investigate any reported security vulnerabilities in Microsoft products. You can also get immediate free support for virus-related incidents on Microsoft products and free prescriptive guidance on securing your Windows systems.

Partnerships and products to further secure your infrastructure today

The Microsoft Gold Certified Partner Program for Security Solutions helps you locate the best providers of security solutions for your IT environment. Microsoft Gold Certified Partners for Security Solutions have proven experience, validated by their customers, in delivering robust, secure implementations of Microsoft technologies. The technologies include key infrastructure security products such as Microsoft Internet Security and Acceleration (ISA) Server 2000, an ICSA-certified firewall; Systems Management Server 2.0, a management tool for distributing security patches; and the Microsoft Active Directory® service, a central repository for all user- and resource-identity management information.

The future of Microsoft products: designing and engineering for maximum security

Microsoft has implemented engineering standards and processes that focus on building greater security into our products during design and development. Some highlights of the new processes include:

- Creating stronger default policies on all software, and fewer services enabled by default, to deliver software solutions that are more secure by default
- Performing exhaustive cross-team security code reviews to help identify and address potential vulnerabilities before the software is released
- Developing and refreshing new threat models to help counter constantly evolving security risks

“Unisys security services, partnered with Microsoft products and solutions, provide our customers with highly secure and cost-effective mission-critical solutions.”

*—Sunil Misra, Managing Principal,
Worldwide Security Practice, Unisys*

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Microsoft



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Technology creates a false sense of security. Packaged solutions have done little more than plug yesterday's holes. This is the problem with information security today.

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secure we are, the more we become.

How can a solution built to solve yesterday's problem be expected to anticipate what is to come tomorrow? Solutions, in and of their very nature, are passive. They cannot learn and adapt. Solutions on top of solutions are no more than static layers designed to surround and contain an ever-changing object — information.

Like information, security must continue to evolve. *Intuitive Information Security* combines human intuition and adaptive technology to deliver intelligent strategies. It is immediate knowledge deployed by tools able to understand how and where information is to be secured across the entire network. Automatically. And only by anticipating change can we become secure.



VOL. 16 • NO. 2 • OCTOBER 15, 2002

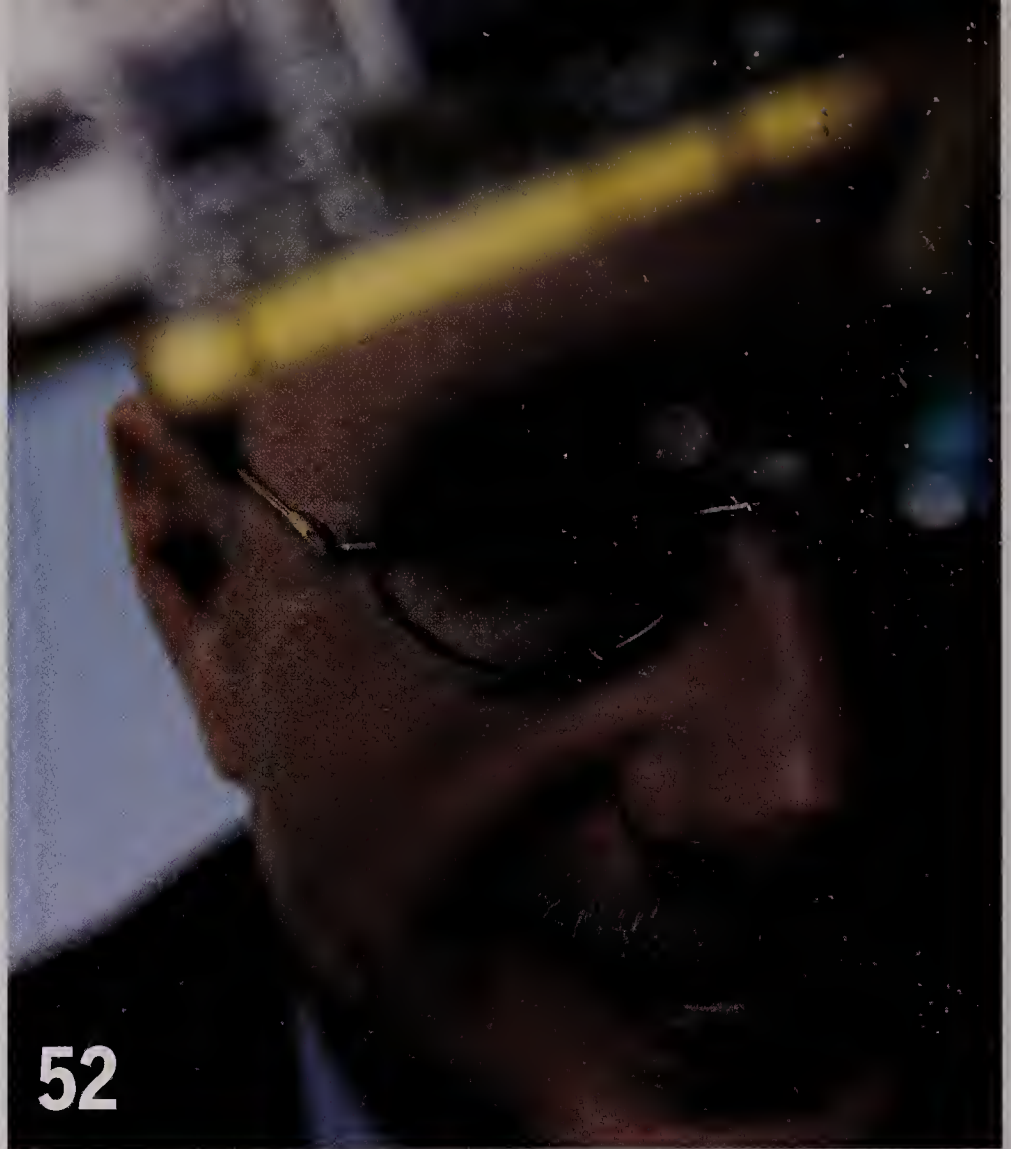
Cover Story

PROCUREMENT STRATEGIES | 52

GOOD STUFF CHEAP

A new hardware market is developing to give CIOs what they want most: good stuff cheap. This is its story. *By Scott Berinato*

COVER PHOTO BY STEVEN VOTE



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Tenneco Automotive CIO Bill Haser has slashed costs by using the secondary hardware market. "Everyone is doing it," he says.

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INFORMATION SECURITY

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A reality check on your top five concerns about reporting security incidents. *By Sarah D. Scalet*

CHANGE MANAGEMENT

They Want a New Drug | 72

In the race to develop new pharmaceuticals more quickly, companies are introducing new IT tools. But the tools can't do it alone. CIOs need to change the way people do their work. *By Stephanie Overby*



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"Legacy behaviors are as bad or worse than legacy systems," says **Roy Dunbar**, CIO of Eli Lilly. "Systems are dumb and can be easily replaced. People are sentimental. And they can't be so easily replaced."

DATA TRENDS

Big Just Got Bigger | 80

It's the dawning of the petabyte age. And with it comes new capabilities for the enterprise, new responsibilities for CIOs and, of course, lots of new problems. *By Fred Hapgood*

RETAIL I.T.

Food Fight | 86

As they struggle for survival against discounters like Wal-Mart, supermarkets turn to IT to make shopping easier, cheaper and more profitable for them. *By Susannah Patton*

BOOK EXCERPT

Finding the Leaders Within | 111

Making sure you have the right people in the right job is more important to your company than strategic direction or decisions. Here are four fundamental aspects to building a solid people process. *By Larry Bossidy and Ram Charan*

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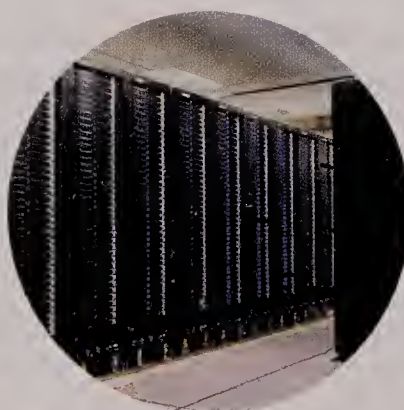
intel.com

Can a microscopic piece of technology solve enterprise-sized problems?



An Intel engineer holds a batch of silicon wafers, each one containing up to hundreds of processors and up to 12 billion transistors.

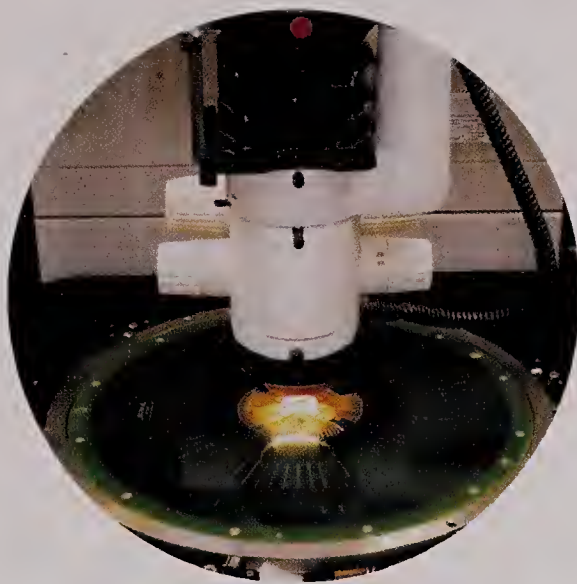
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with the emblem on so many PCs:
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world's servers* are powered by
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business-critical applications.



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Columns

TOTAL LEADERSHIP

Leadership from Below | 46

Tap into talent at all levels of the organization. *By Patricia Wallington*

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E-commerce can flourish anywhere if you build the right business model. *By Mohanbir Sawhney*

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Fed Up with Feedback | 132

New software promises to automate performance evaluation. And we don't like it. *By Alison Bass*

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Shell-Shocked? | 136

It's time to come out from hiding and start scaling up IT. *By Gary Beach*

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Amazon profits from outsourcing; IT helps the homeless; A \$5,000 scooter. *And more*

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The Heart of Change and Book Talk

WASHINGTON WATCH | 40

Financial rules may promote e-business investments.



"Leading from below is a high-wire act that requires almost bipolar behavior—courage and confidence balanced by humility, assertiveness yet deference."

—Patricia Wallington, Total Leadership columnist, on tapping into talent Page 46

EMERGING TECHNOLOGY | 116

Wireless Wranglers

Managing wireless devices is a daunting task. Cell phones, PDAs, notebook PCs and other mobile wireless gadgets are easily lost, occasionally stolen and difficult to inventory. Enterprises with proliferating wireless devices are now looking to bring order to their mobile fleets by using wireless device management software.

By John Edwards



EMERGING TECHNOLOGY | 116

Management software promises to harness wild mobile devices—eventually.

By John Edwards

COOL PRODUCT | 120

New tools help administer security for PDAs.

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Bud Bates: There may be lots of glass under the streets—but will all the fiber work when we need it?

In Every Issue

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The secondary market for IT products is growing. Are you testing the waters? *By Abbie Lundberg*

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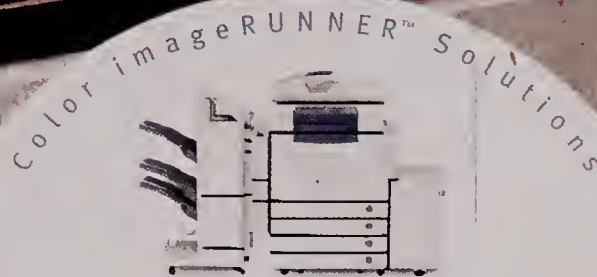
EXECUTIVE SUMMARY | 140

Abstracts of all the feature stories found in this issue.

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so her staff could do more



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Canon KNOW HOW™

It's not how many ideas you have.
It's how many you make happen.



In 1996, after three years of explosive growth but few changes in its operations or business processes, electronics-retailing giant Best Buy's profitability had evaporated and its stock price was plummeting. The

company needed a major—and immediate—transformation.

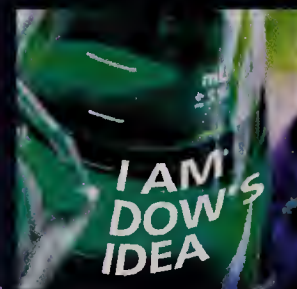
I am Best Buy's idea, delivered. Best Buy partnered with Accenture to engineer one of the most dramatic success stories in retailing history. In a two-year program applying process, methods and tools that Accenture calls Scientific Retailing, Best Buy increased net earnings 138% and drove its stock price from \$2 to \$57, increasing its market cap from \$403 million to \$11.4 billion.



As the global leader in enterprise information storage solutions, EMC recognized that a complete overhaul of its existing business systems was needed to sustain future growth.

I am EMC's idea, delivered.

Accenture teamed with EMC to design and build a massive, scalable information infrastructure to integrate all of EMC's systems and processes globally, accelerate new product introductions and give management more flexibility in responding to changing market conditions. Now, design changes can make the rounds to 6,000 users around the world in minutes, instead of days.



To develop a sustainable competitive advantage in the global chemical industry, Dow sought to aggressively leverage its investment in information technology, dramatically improving systems productivity and significantly reducing application costs and time to market.

I am Dow's idea, delivered. In a unique outsourcing relationship, Accenture helped Dow consolidate nearly all of its IT activities into four regional centers. Jointly staffed with professionals from both companies, the centers have accelerated time to market by 10%, increased overall productivity by 30% and made a hefty contribution to \$70 million in annual IT savings since 1992.

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THAN THEY APPEAR

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Interactive features from October 15 to October 31



SEE MORE

Inside a Hardware Rebirthing Facility

In the course of reporting his story **Good Stuff Cheap** (Page 52), Senior Writer Scott Berinato toured Hewlett-Packard Financial Services, which handles leasing—and the reselling after equipment comes “off lease.” See what happens to hardware that’s destined for rebirth in this online photo exclusive.

READ MORE

Take the Lead in Change Management

Turning around legacy thinking is hard (see **They Want a New Drug**, Page 72). FedEx has been there, delivered that. Read **Next Day Change Guaranteed**, online, to find out how it did it.

DEBATE UPDATE

FOIA Exemption

Get the latest on proposed exemptions to the Freedom of Information Act (see **Fear Factor**, Page 62). Go to www.cio.com/printlinks.

ASK THE AUTHOR

How can I hire the right people?

If you don't get the people process right, you will never fulfill the potential of your business. So say Larry Bossidy and Ram Charan in **Finding the Leaders Within**, Page 111, an excerpt from their new book, *Execution: The Discipline of Getting Things Done*. Pose your questions about hiring to Charan through the end of this month.

Find links to the stories mentioned at www.cio.com.

Our Daily Web

MONDAY Tech Tact Technology Editor Christopher Lindquist on what's next.

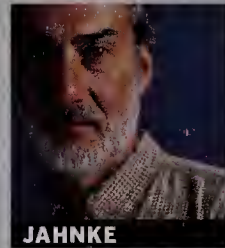


TUESDAY Alarmed Security experts Sarah D. Scalet and Scott Berinato give you something new to worry about.



WEDNESDAY Metrics Web
Writer Jon Surmacz makes
sense of the numbers.

THURSDAY Sound Off Web
Editorial Director Art Jahnke
opines on ethical dilemmas.



FRIDAY The Big Picture Charts
and graphs worth a thousand
words.

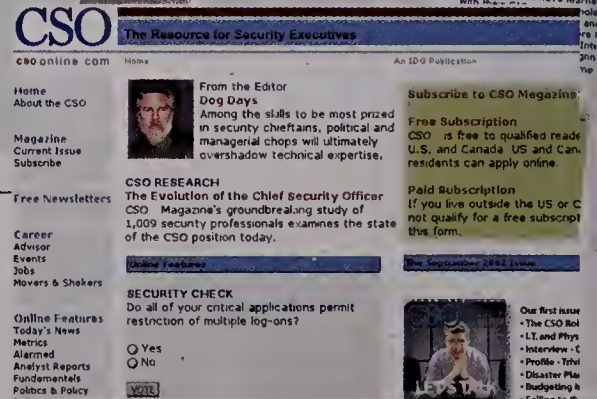
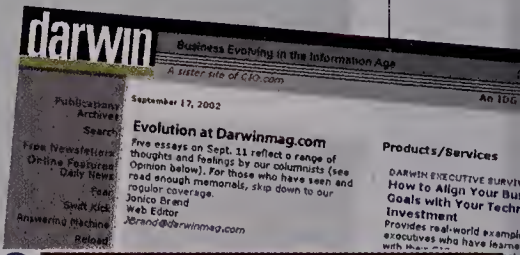
Peer Resources

Stories from CIO's publishing cohorts, Darwin-mag.com and the new CSO magazine, relate to articles in this issue. Check them out for yourself or for your colleagues.

CIO's Fear Factor (Page 62) takes a close look at the hesitation to report security breaches. **CSO's The Human Touch** discusses raising company awareness of security issues.

CIO's **Food Fight** (Page 86) covers the new technologies that are cooking in the old-time grocery chain. Darwinmag.com's **Consumer Chain of Command** checked out the new self-checkout lanes—and fired up some heated debate.

Find these features at
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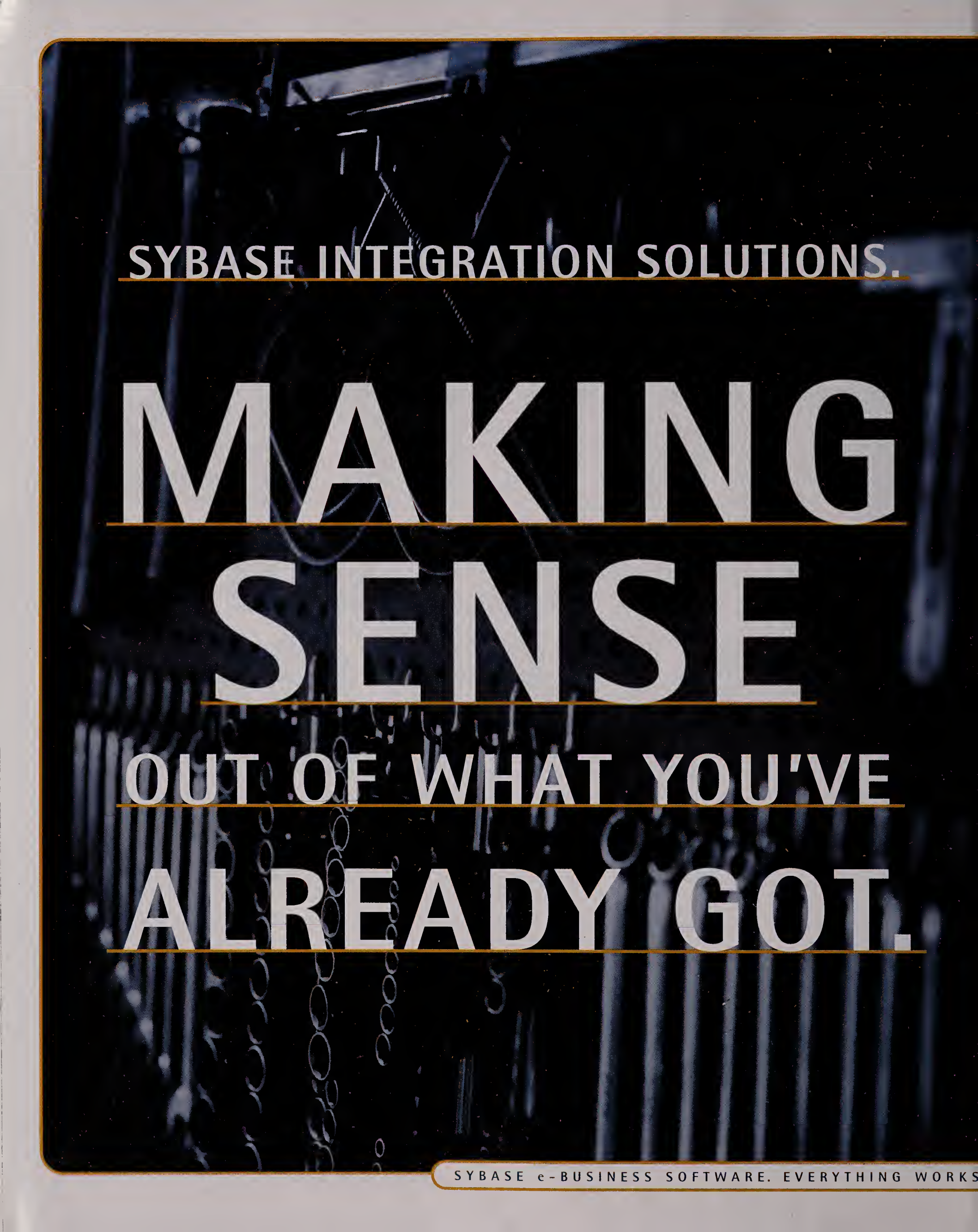
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Among our growing list of customers, you'll find global financial service companies, healthcare companies, United States government agencies, as well as telecommunications providers and a host of other enterprises.

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Our Sybase Business Process Integrator (BPI) Suite enables the rapid deployment of business process integration projects while minimizing time to market and reducing risk.

The Software Integration Company

We can help you integrate all the disparate data and business applications running in your enterprise and extend them to any location in the world: platforms, application servers, components, databases, applications, processes, message brokers, even mobile/wireless solutions. By choosing Sybase, you can preserve and extend your existing infrastructure investments, avoid proprietary traps, and improve efficiency across the enterprise.

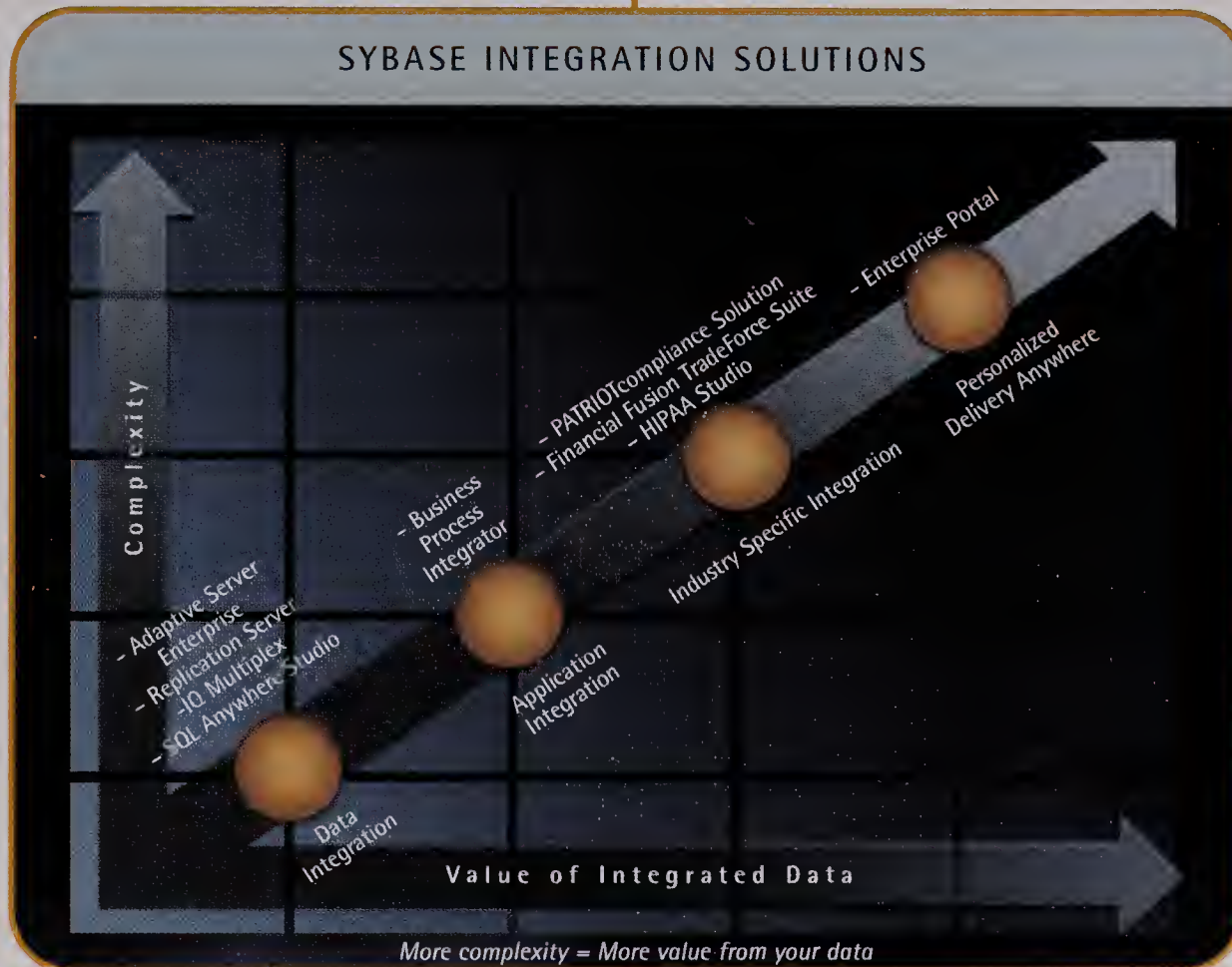
You can see it in action in our TradeForce™ Suite for Straight Through Processing (STP) from Financial Fusion, in our HIPAA Studio Solution, and in our PATRIOTcompliance Solution for the USA PATRIOT Act.

SYBASE ENTERPRISE PORTAL

Once you've integrated your data and applications, you need a better way to

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In this era of restricted budgets and reduced capital expenditures, it's necessary to find ways to extract more value from the systems you already have in place. It's critical that you put all the information you have, wherever it may be, to work for you. Our integration solutions do just that. These modular packages can help you



personalize and securely interact with that information. That's where our Enterprise Portal comes into play.

The Sybase Enterprise Portal is built on a unified, scalable and highly flexible framework. It can deliver your back-end applications in real time – completely customized to your needs. Best of all, you can implement it in stages and reduce costs today while positioning yourself for competitive advantages tomorrow.

Our global leadership here is evident. Gartner, Inc. positions Sybase in the leadership quadrant of this important and rapidly growing space.

integrate every data source and application from the back office to the front, from the legacy mainframe to the wireless device in the customer checkout line.

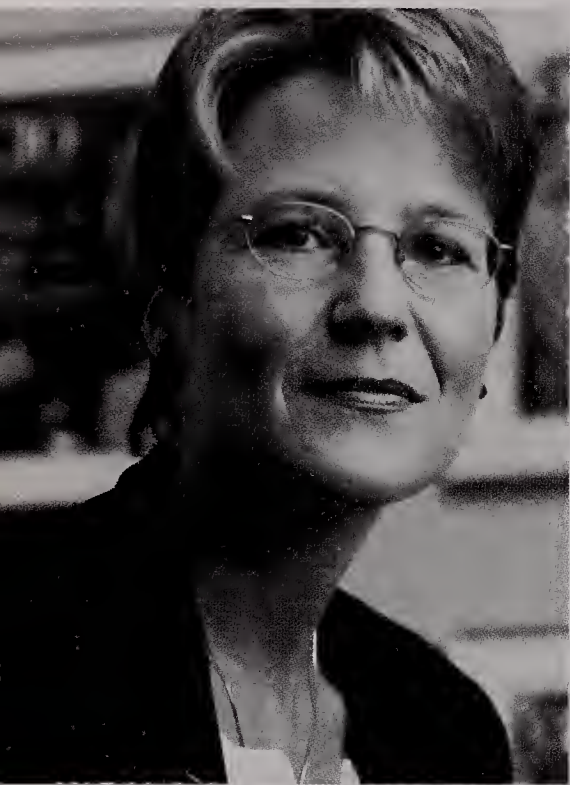
For more information, point your browser to: sybase.com/integrationsolutions.

And get a lot more value out of what you've already got.



From the Editor

lundberg@cio.com



To see the complete results from our "Second-Hand IT" survey on the used IT hardware market, go to www.cio.com/printlinks.

A Bargain Hunter's Guide to IT

IN EVERY RECESSION, consumers (individual and corporate) are more cautious about spending and look for bargains under every rock. The current recession is no exception, but there's a new twist this time. Thanks to the massive amounts of hardware that got devoured during the late '90s and the subsequent failure of many asset-bloated dotcoms, there's a new way for CIOs to get good stuff cheap. The secondary market for information technology has ballooned from a marginal curiosity to a force to be reckoned with.

The second-hand market is big. Seventy-seven percent of IS executives recently surveyed by *CIO* are purchasing secondary market equipment, and 46 percent expect to increase their spending in that area next year by some 15 percent.

"There is so much used hardware available now—and so much emphasis on cutting costs—that the secondary market is no longer a niche business," writes Scott Berinato in "Good Stuff Cheap," beginning on Page 52. And experts argue that while this trend has been stimulated by the combined forces of the dotcom buildup and crash followed

by a generally moribund economic climate, this market is here to stay—at least for a while.

A lot of the equipment finding its way into this market has a pretty long shelf life—chips, routers, motherboards and the like. And there's a lot of it out there—enough to support the secondary market for years to come. One sign that this is more than just a blip is the number of service organizations emerging to make it easier for IT buyers to get what they need without getting taken.

Smart vendors are learning to live with (and participate in) this new reality. Others still have their heads in the sand. They'd better smarten up. After going to the trouble of learning the ins and outs of this admittedly complex market, the 77 percent of CIOs who have already tried this out are not likely to go back to buying retail if they don't have to.

Whether you've bought from the secondary market or not, Berinato's article is a great view of what's happening with third-party brokers and the major vendors, how CIOs are making this new market work for them, and how *you* can manage the risks. In this economy, it's a must read.

Allie Lundberg

In the Midst of the Telecom Storm... Is your Network Provider a Safe Harbor?



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Reader Feedback

WHAT ABOUT I.O.?

We were surprised that the July 15, 2002, "Buyer's Guide to IT Value Methodologies" did not include Information Orientation (IO), which measures how effectively companies manage their people's use of information and IT. This metric has been statistically validated and proven to be directly linked to business performance. The IO metric was discovered during a four-year research project conducted at IMD International, Europe's leading business school in Lausanne, Switzerland.

The research findings were documented in the summer 2000 edition of MIT's *Sloan Management Review* (available at smr.mit.edu/index.html).

Joyce P. Marchand • COO • *EnterpriseIQ*
Lausanne, Switzerland • jmarchand@enterpriseiq.com

MORE ON CONSULTANTS

I read with great interest your article ["Take Control," July 15, 2002] about the attitudes of the IT departments toward the Big Five consulting companies. During the past 10 years, I have had firsthand experience working with Deloitte Consulting, PWC and Accenture, and I can relate to almost all the experiences recounted in your article.

However, there is something to be said about the gullible nature of the managers who hire these companies in the first place. In my experience, there is a prevalent notion in management circles that just because you hire someone as a consultant, they know better than you do. As pointed out in the article, these companies present their best candidates during the interview process, and then you get stuck with mediocre or even less qualified staff who have no notion of how to operate, much less manage a complex endeavor.

In-house employees begin to develop an adversarial relationship with these consulting companies because not only do they have to teach these consultants about their business but pay them exorbitant rates to get mediocre work done.

I think it is very important that each client structure the contract to control the quality of people the consulting firm



brings in as a part of the contract to mitigate this from happening. More important, I think that management needs to pay close attention to the work environment and the quality of the deliverables being produced by the consulting companies; it often happens that the partners at these companies update the senior management on their "view" of the project's progress on the golf links rather than in structured reviews.

Dinesh S. Thakur
dineshthakur@comcast.net

[Editor's note: Consulting practices will inevitably conform to what clients are willing to put up with. Demand better.]

FOR THE RECORDS

I was very disappointed by the "Take the Pledge" [July 1, 2001] article. If a CIO was asked to delete records, how would he know which guidelines to go by better than a records or knowledge manager? In my company, where I am a knowledge manager, we have created a records retention schedule, along with an e-mail and Internet policy. Nowhere in your article are records and knowledge management cited. It's a shame. Our relationship with IT is often difficult, and the boundaries are not clearly defined. But the technology belongs in IT, and the management of the information content belongs in records management.

Valerie McMorrow
Associate Knowledge Manager
Calpine Corp.
San Jose, Calif.
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[Editor's response: Most CIOs would argue that they are the stewards of company data, and thus they have a responsibility for what happens to that data, including records. A record retention schedule/policy is an excellent tool that all companies should implement.]

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Send your thoughts and feedback to letters@cio.com. Letters may be edited for length or clarity.

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Ask the Expert by Unisys

Jim Cassell joined Gartner Group 14 years ago after 22 years at IBM. Since then he has developed a reputation as one of the world's foremost large systems analysts.

> *How do you know if your site is a good candidate for server consolidation?*

> The excesses of the 1990s often resulted in hundreds of servers being deployed throughout organizations for specific business units or for specific applications. We have found that these servers can feature very low utilization, frequently in the 5% to 40% range. Specific IT staff are assigned to these servers to keep them running, regardless of their utilization. Not only that, but we have found these servers very often to be over-provisioned because they were outfitted for peak-load performance. They represent highly inefficient islands of automation and are prime candidates for server consolidation.

> *What is the business value-proposition of server consolidation?*

> Well, of course, you can save on the hardware and software that is barely being used. But our data shows that 55% of IT costs typically go to internal personnel, with a further 10% to hardware and 10% to software; the rest goes to other items. Thus, the great potential here is for significant savings on IT staff through consolidation. You don't simply transfer the staff to larger systems because, for one thing, the larger systems are optimized to run more automation software, which is affordable in the consolidated environment. This is software that requires little or no human intervention, thus allowing lower staff costs. We think this is why just about every CIO today is thinking about consolidation.

> *What about security in the consolidated environment?*

> It's just plain easier to manage security in the consolidated environment. If you have 10 servers versus 100 smaller servers, think of how much more manageable it is to do the frequent security software updates that are required today. You'll cut security administration costs potentially, and the CIO will have more confidence in the overall security of the servers, because the staff has fewer machines to focus upon.

> *Any other attributes of consolidation?*

> Partitioning is a big one. If you are consolidating disparate servers—those running databases that are vastly different from one another and don't "play" together well—you can place each database in a separate partition of a big server. If one fails, you don't crash the other. And with partitioning you can manage each of the database workloads through a single instance of the operating system.

> *In the consolidated world, are there good alternatives to UNIX?*

> The Intel platform with Microsoft Windows 2000 Datacenter has come a long way toward meeting the needs of many of what I call industrial-strength applications. Together they provide a large measure of the functional requirements, like availability and reliability, compared with UNIX. Reliability is key in the consolidated environment because the impact of a server failure is greater than it is in a more distributed environment. And just about every company has plenty of Microsoft technology already in the organization, so the staff skills are there to support this platform.

Automation software ... requires little or no human intervention, thus allowing lower staff costs. We think this is why just about every CIO today is thinking about consolidation.

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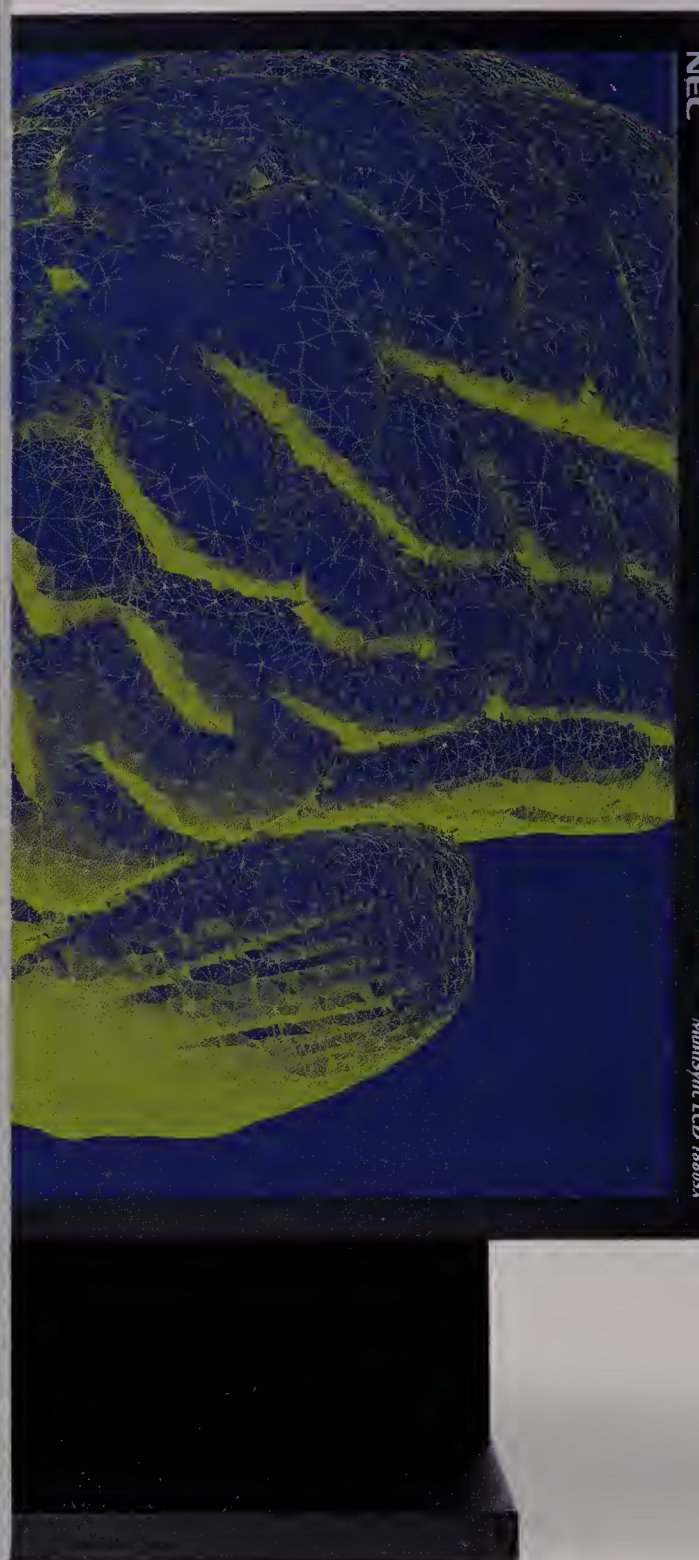
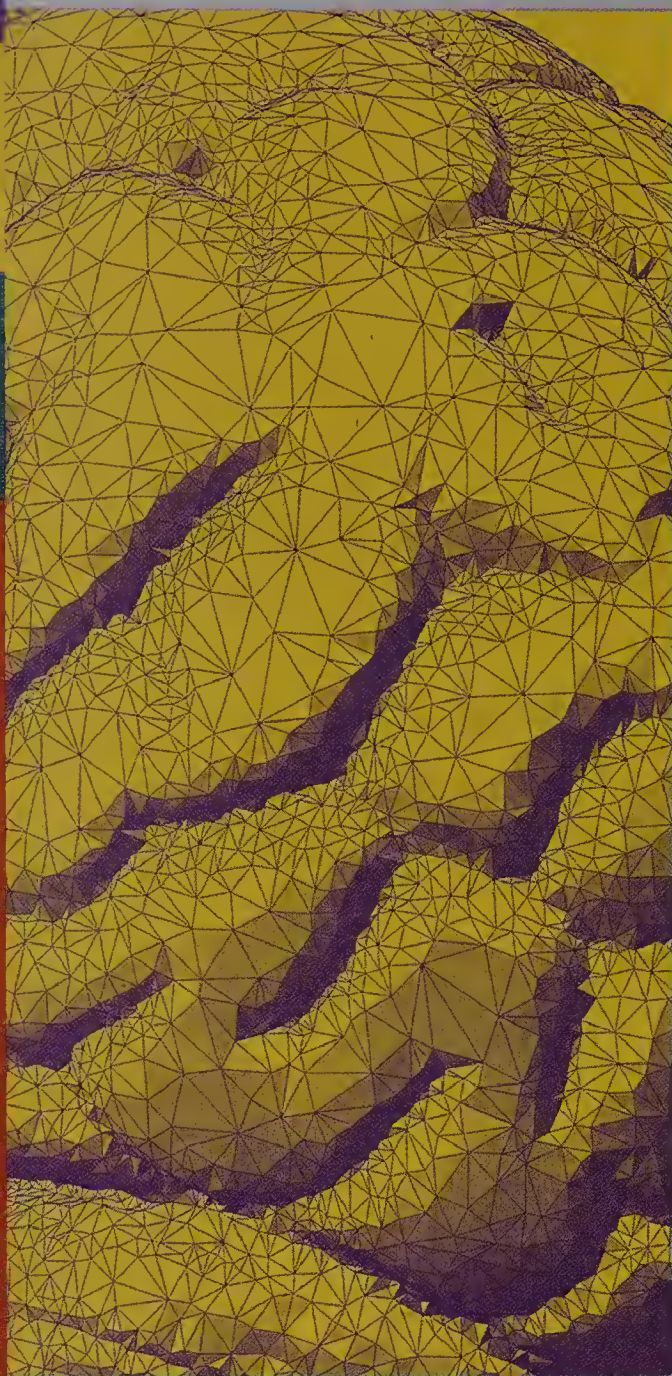
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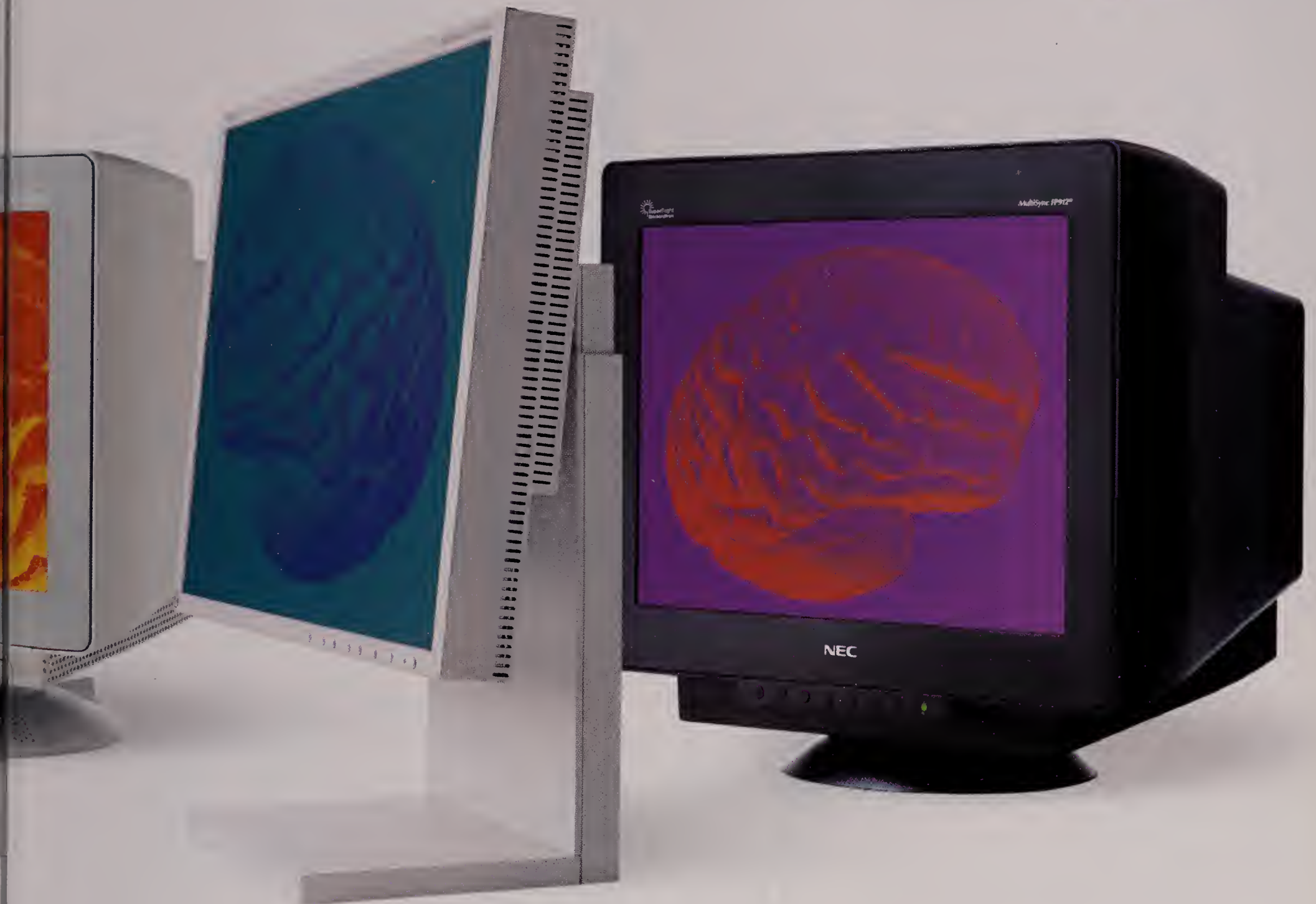
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trendlines

the NEW the HOT the UNEXPECTED

Edited by Lafe Low and Michael Goldberg

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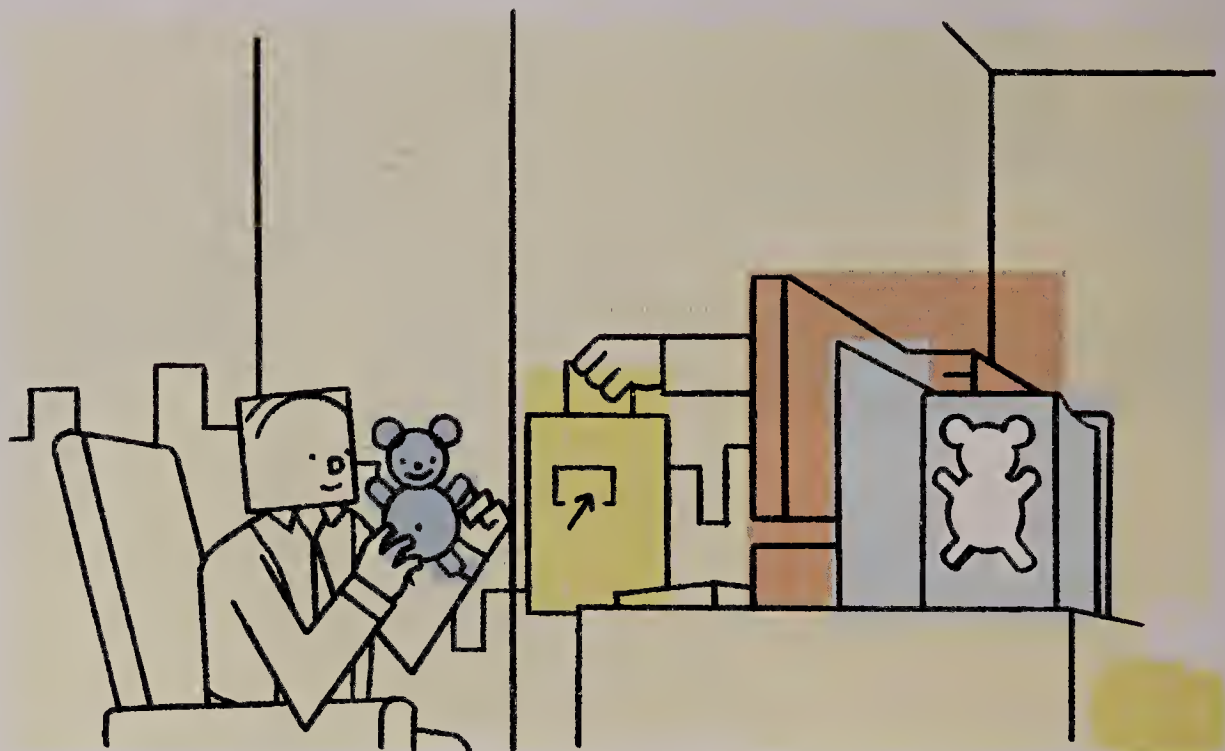
Amazon Finds Profits in Outsourcing

SINCE ITS FOUNDING IN 1995, Amazon.com has taken a lot of titles. Internet bookseller. Warehouse builder. Personalization expert. Shipping discounter.

Now add *outsourcer* to the list. The big Web store is quietly building an e-commerce outsourcing business with customers like America Online, Target and Virgin Mega-Stores. Visit Target.com, and you see the Target bull's-eye logo. Amazon.com, however, is making it work behind the scenes.

Those are three of the five significant e-commerce deals Amazon has announced since its August 2000 deal with Toys "R" Us. Overall, the company has more than 30 partnerships (though many of these partnerships are pure marketing deals, à la Drugstore.com, which shows up when you surf for "health & beauty" on Amazon.com).

As the e-tail sector prepares for the peak holiday shopping season, it's interesting to note that when it comes to selling goods or selling online know-how and services, it's



the services that brings better profit margins, according to Amazon.

In general, services generated \$225 million in sales for Amazon.com in 2001; that's about 7 percent of the company's \$3.1 billion in total revenue for the year. Sales of books, music and DVD movies, Amazon's biggest business, earned 29 percent gross margins last year. Services, its smallest unit, had 68 percent gross margins in 2001, and it has generated nearly \$100 million in sales for the first half of 2002.

So far, it's been a select group of partners that contributes to this services business. Besides Virgin and Toys

"R" Us, Amazon.com runs sites for Borders, has built a new version of Target.com and licenses some features, such as its search tool, to AOL's shopping area.

Owen Van Natta, Amazon's vice president of business development, says the company has a meaningful commitment to generating more such deals but wants to remain selective. Name-brand companies "that are really committed to the customer experience, those are also the partners that tend to really appreciate" what Amazon has built, Van Natta says.

Neither Amazon nor its clients say much about how the deals are structured. But so far, Amazon seems to have made customers like Borders.com happy. In April, its parent company, Borders Inc., extended its deal with Amazon, allowing customers to pick

Continued on Page 30

STATSHOT: Halloween

\$1.98 billion: candy sales for Halloween 2001 (making it the leading candy holiday)

\$2.03 billion: projected sales, Halloween 2002

20 million: estimated pounds of candy corn Americans will purchase this Halloween

\$13 billion: value of U.S. retail chocolate industry

10 percent: volume of Hershey Food's 2001 sales attributed to largest customer, Wal-Mart

4,016 pounds: weight of world's largest lollipop (62.8 inches across), presented in Chicago, June 2002

SOURCES: NATIONAL CONFECTIONERS ASSOCIATION, HERSHEY FOOD CORP.



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Amazon.com

Continued from Page 28

up Web purchases in Borders stores. Borders also said Amazon.com would take over the site for its Walden Books subsidiary.

Bob Edington, who is Border's director of retail convergence services, calls Amazon "best in class" because it's best able to convert site visitors into buyers. Edington says Borders decided to outsource its site because

it wanted to focus its technology staff on in-store efforts, like kiosks, but still have a site that would draw customers.

Both Amazon and its partners gain sales and traffic—Amazon's traffic grew 34 percent last year, compared with 7 percent for overall U.S. Internet traffic, according to Nielsen NetRatings. The bigger picture for

Amazon: more products. Successful e-commerce sites "need to be one-stop shopping destinations. These deals give Amazon a leg up" on rivals like Yahoo and eBay, says Dawn Brozek, a NetRatings analyst.

So, if you're a retail sector CIO, don't be too surprised if Amazon.com knocks on your door. —Michael Fitzgerald

G O V E R N M E N T I . T .

Can IT Help the Homeless?

SAN FRANCISCO SPENDS MORE money per capita on homeless services than any other city in America, says San Francisco County Supervisor Gavin Newsom. With direct services, shelters, hospitals, police and paramedic costs, and shopping cart retrieval programs, he estimates the county spends roughly \$250 million per year on homeless services. In spite of all that funding, though, as many as 200 homeless people die on the streets of San Francisco every year because they're not receiving proper care. And the problem isn't improving. From 2000 to 2001, the number of people on the streets rose 36 percent. So what gives?

Newsom believes the cause is a "remarkably dysfunctional" bureaucracy of disparate social services agencies without the proper IT infrastructure to share data and coordinate services. "We have a system where there are a couple hundred empty shelter beds every single night, and yet there are thousands of people sleeping on the streets. How is it possible that we have empty shelter beds? One hand doesn't know what the other is doing," says Newsom.

To improve interagency coordination, Newsom has 30 separate proposals to reduce homelessness, one of which is on the November city ballot and many of which hinge on IT. He wants to establish a centralized system for admitting new beneficiaries into social services programs. He also wants to install a LAN to enable agencies to share information about individual cases, collaborate on creating customized case management plans and track a person's progress toward independence. As

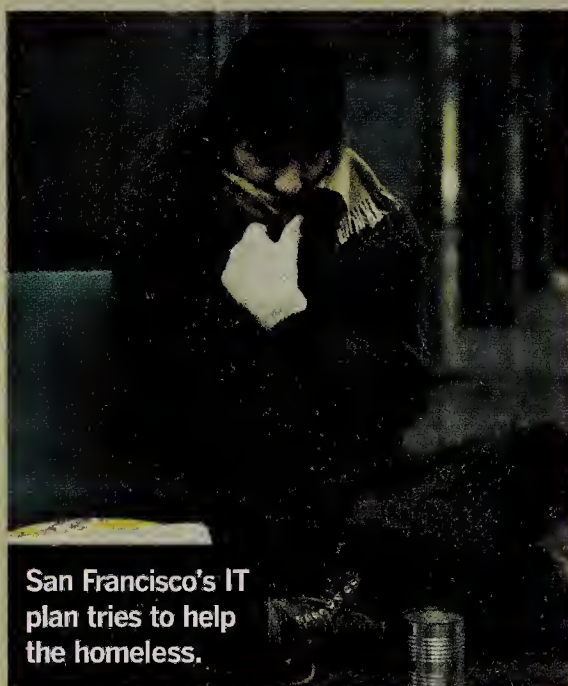
well, he hopes to equip outreach workers with wireless PDAs so that they can evaluate beneficiaries they meet on the street and submit that information in real-time to the agencies treating those people.

Although his ideas sound noble, Newsom's proposals have created a stir among homeless advocates. One of the proposals will outlaw panhandling on certain strips and another calls for wider deployment of a finger-imaging system network—which homeless advocates associate with the criminal justice system—to track the progress of homeless folks as they move through the social services system.

Newsom says he has RFPs out for the PDAs and hopes the department of human services can start rolling out the network for the finger-imaging system by the end of the year. While San Francisco's liberal mayor Willie Brown is in favor of his conservative colleague's initiative, San Francisco's vocal, organized

advocacy community could derail Newsom's efforts come the mayoral elections in November 2003.

If his plan is approved, Newsom says the effort that will go toward creating a "boundaryless" homeless services system will be well worth the \$1.5 million price tag. "The payoff will be turning someone's life around," he says. —Meridith Levinson



San Francisco's IT plan tries to help the homeless.

How do we have empty shelter beds? One hand doesn't know what the other is doing.

—GAVIN NEWSOM, SAN FRANCISCO COUNTY SUPERVISOR

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Off the Shelf

Edited by Carol Zarrow

Making Change Real

The Heart of Change: Real-Life Stories of How People Change Their Organizations

By John P. Kotter and Dan S. Cohen

Harvard Business School Press, 2002, \$20

TO HEAR COAUTHOR John Kotter tell it, all epiphanies are visual and emotional. We won't really change our behaviors—and by extension, the tired, old and inefficient manner in which we work—unless we see something truly dramatic that causes us to have an emotional reaction. That emotion, he argues, is more important than memos, meetings, even money. A strong emotional reaction to something we see is what causes us to get off the dime and change things around us. That emotion can be positive or negative, but what matters is the strength of the feeling. Likewise, what we see—the visual content—is unimportant. It just has to be memorable enough to sear itself into our mind's eye forever.

BOOKTALK

“Since I taught writing at MIT, I was particularly intrigued by the rhetoric of reengineering. Like most cultural revolutions, it insisted on a new vocabulary. It is almost too easy to make fun of this rhetoric, which had a serious purpose: to help usher in the new world by providing a new language to explain to ourselves what we were doing. One staff member marveled: ‘Five years ago I’d never heard of facilitation, and now it’s all we do!’”

—From *Retooling: A Historian Confronts Technological Change*, by Rosalind H. Williams (The MIT Press, 2002)

For instance, the procurement department at a manufacturing company wanted to centralize its processes to save money but got no response from top managers. So the procurement project manager assigned a summer intern to research the number of different gloves the company's factories bought and how much they paid for each type. Astoundingly, there were 424 different types of gloves, all purchased separately by the factories at wildly different rates. That fact made a great statistic for a report, but the statistic itself didn't make a real impression on anyone. One day, the project manager made a pile of all 424 different types of gloves—with the prices paid for each pair attached to them—on a conference table in the company's boardroom and invited all the company's division presidents in to take a look. They were speechless. The gloves went on the road to all the company's division headquarters for all to see, and the procurement effort finally got off the ground.

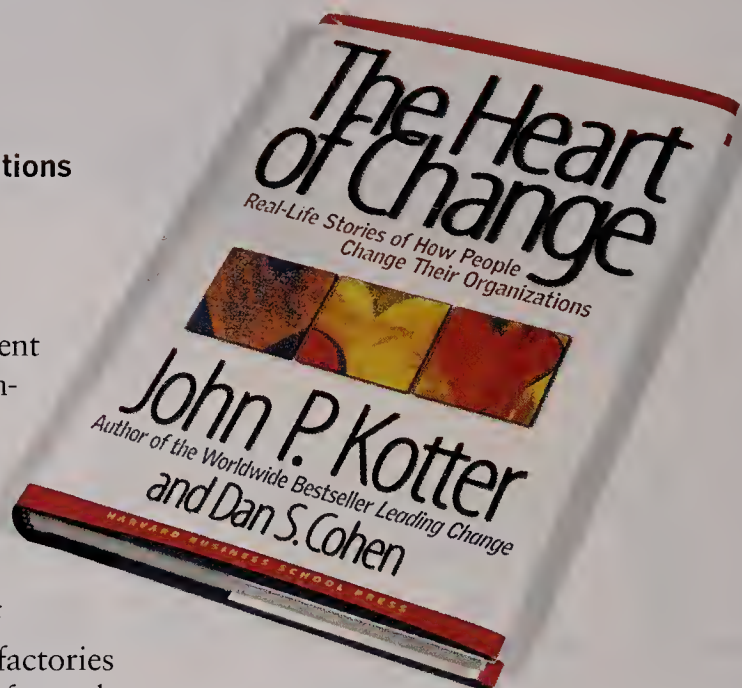
Such stories are the core of *The Heart of Change*, and they are, for the most part, as evocative as the glove story. In another story, an airplane manufacturer announces that, effective immediately, no airplane “carcass” will be moved past the first phase of construction until all the parts for that phase have arrived—sacrilege in that industry, where parts are notoriously late. In turn, people begin scrambling—and inventing new work practices—to get the parts in so that the airplane that's currently in production can stop

looking like a whale beached in the hangar.

Those stories, however, are also the book's weakness. If you've already read Kotter's much beloved *Leading Change* (Harvard Business School Press, 1996), you'll note that its eight-step method for change leadership is in this book also; but now each step is filled out with a story. The problem is, *The Heart of Change* really contains only two types of stories. One type, the glove story, shows how “shock therapy” can get people to recognize a problem. The other, the airplane story, shows the effectiveness of integrating a dramatic moment into a work practice that needs to change. Once readers get the lesson, though, they don't need it repeated eight times.

Still, reading these stories will stir the same kind of emotional reaction that they did in the companies where they actually occurred. And maybe you'll get yourself off the dime and start your own change effort inside your company. That would mean *The Heart of Change* has had more impact than most management books. If you're looking for a more in-depth, intellectual explanation for how to make change happen, read *Leading Change*. If you're looking to get fired up, read this one.

—Christopher Koch



iPass® Inc. and
Customers Team
Up to Tackle
Global Broadband
Connectivity
Strategies



Answering the Tough Questions About Wireless Networking

THE WORLD SEEMINGLY GETS SMALLER AND SPINS FASTER AS global communications drive the pace of work. Instead of 9 to 5, it's 24/7. And the day of the desk jockey has increasingly yielded to the mobile worker who needs to do business anywhere — everywhere. Airports, hotels, coffee shops: If there's a chair and a place to prop the laptop, work gets done.

As the where and when of the workforce become more flexible, the underpinning technology at the workplace needs to match. Whether it's the sales team that needs to check emails while waiting to board the plane, or the marketing VP burning a little midnight oil at home, workers must access the valuable data stored on the corporate network. They need—demand—fast, easy, global connectivity.

Satisfying that demand isn't simple. The CIO knows that productivity jumps when workers can access the nuggets of corporate data stored on the network. But enabling easy, remote connectivity is hard. It requires a network of coverage to satisfy the demands for global connectivity. The CIO must seamlessly integrate this

new technology onto an existing infrastructure—all without breaking the bank. Most importantly, the CIO must deploy security technology to keep that data safe.

The Wi-Fi Challenge

Traditionally, IT leaders have relied on remote dial-up connectivity solutions. But today's information-hungry workers are dissatisfied with the turtle's pace of dial-up connections. They want the speed of broadband. (Witness: AAA will soon require all 4-star hotels to offer broadband connectivity in their rooms.) Workers also want mobility, something wireline



Custom Publishing
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The rise of wireless broadband connectivity has created a whole new

DEGREE OF DIFFICULTY for management.

broadband can't satisfy. So, increasingly, mobile professionals are turning to wireless broadband connectivity, logging onto Wi-Fi "hotspots" at public venues such as hotels and convention centers.

Yet the rise of wireless broadband connectivity has created a whole new degree of difficulty for management. CIOs who don't seek a corporate-wide solution to enterprise connectivity face the very real danger that their users will jump aboard local wireless hotspots without considering the inherent security risks. "Maverick wireless connectivity usage extends enterprise data into zones where there are non-enterprise users on the network," says Jason Smolek, an analyst at the research firm IDC. "It brings up a whole host of security issues."

The iPass Solution

iPass, the Redwood Shores, Calif., company that built its reputation on worldwide dial-up remote access services, capitalizes on that expertise in the wireless broadband arena with its Global Broadband Roaming service.

At a time when CIOs might be nervous about taking a leap into wireless connectivity, they can feel confident that iPass is a solid company with a proven track record, says Amy Cravens, an analyst at research company In-Stat/MDR in Scottsdale, Ariz. "iPass has been very thorough in ensuring that this fundamental need is addressed, keeping control of the access to the corporate network under the IT department," she says.

Already, longtime customers such as SAP, J.D. Edwards and Documentum

use iPass' dial-up service, and pioneers such as Cargill, Incorporated are piloting the new wireless solutions.

FAQs About Enterprise-wide Wireless Broadband Connectivity

Q How do I best provide 24/7 access to my users?

A Keep it simple and easy. Users don't want to have to wrestle with a slew of different user interfaces or a labyrinth of steps to get connected. "Our end users are typically not techies," says Jon Russo, vice president of marketing at iPass. "We designed our software with this fact in mind. The user interface needs to be intuitive. By making connectivity as easy as one-click and providing the same user experience independent of the

J.D. EDWARDS & COMPANY

A Global Solution — and Savings

AS ONE OF THE WORLD'S LEADING DEVELOPERS OF AGILE SOFTWARE SOLUTIONS, J.D. EDWARDS HAD A CONNECTIVITY PROBLEM OF GLOBAL PROPORTIONS.

"We currently have about 5,000 employees worldwide, and more than 4,000 of those require remote network access in some form, from a couple of times a month to eight or 10 hours a day," says Mark Endry, senior vice president and CIO of J.D. Edwards. "We have teleworkers accessing documents and information from various locations, sales executives and support people traveling all over the map, and systems managers who need to monitor, troubleshoot and respond to customer problems at all times of day or night."

What the company didn't have was a reliable way to ensure fast, simple and cost-effective connectivity for its workers around the world. After struggling with a provider whose network of local numbers was patchy outside of major U.S. cities, Endry and his crew discovered Corporate Access service from iPass, which delivers high-performance

connectivity by combining over 180 networks in 150 countries as well as network redundancy in every major business center. The results have been remarkable.

For one thing, the deployment was a snap, says Catherine Miller, IT team leader for the company. "It was one of the easiest deployment projects I've ever been involved with," says Miller. "It was a breeze, which is very unique for a deployment of this size."

iPass' service also paid off handsomely in terms of cost savings. Managers are enthusiastic about the potential savings on telephone tariffs, hotel telephone bills and international network connection charges. In fact, an analysis of iPass traffic compared with the company's previous assortment of carriers and providers projected savings of 30% to 40% on worldwide Internet roaming costs.

"It was one of the easiest deployment projects I've ever been involved with."

— Catherine Miller,
IT team leader,
J.D. Edwards

DOCUMENTUM

Easing the Toll of Secure Access

iPASS HELPS DOCUMENTUM REAP TREMENDOUS SAVINGS.

connection technology, we're also saving the IT department time and expense on training."

"Long term, we envision taking it one step further where iPassConnect™ client software is smart enough to guide the end user through the connection process," Russo adds. "This way it eliminates the need for end users to know the difference between Wi-Fi and a 3G network."

Another place where the iPassConnect client saves time and money for the IT department is on software upgrades. "iPass has perfected a method of deploying upgrades to our software by uploading only those elements of the software that require change," says Russo.

The iPassConnect software therefore is a powerful connectivity tool. This standards-based software gives users the comfort of having the same interface no matter how they connect, be it dial-up, Ethernet or wireless broadband. To the users, every connection looks the same, providing the comfort of reliability and ease of use.

Q What are the big benefits of wireless broadband connectivity?

A In a word, productivity. By taking out the downtime inherent in much mobile work, business people have more opportunities to crunch numbers, write reports, analyze data—all the million-and-one tasks that keep the corporate engine humming.

"The iPass Global Broadband Roaming service will significantly increase the productivity of our mobile employees as they endure extended waiting times in airports, hotels and other public locations," says Joe Przepiora, global IT manager at Cargill, Incorporated. "Our employees can now have high-speed connectivity in

The enterprise content management provider depended on an 800 number and a bank of modems, along with access software from a major provider, for remote connectivity for its 950 employees. But when the Pleasanton, Calif., company looked closely, "We discovered that we were spending \$1 million a year in remote access service costs," says Jeff Ward, the director of IT at Documentum. "People were sitting on 800 numbers for 36 hours at a time. They'd log on and never log off."

As Ward and vice president of information technology George Lin wrestled with the problem, they realized that outsourcing the entire connectivity issue made a lot of sense. "We have a history of outsourcing, so it fit right in with our IT business model," says Lin. "We choose best-of-breed vendors and let them do the work for us."

In this case, the choice vendor was iPass, which in nearly a year has made an enormous difference. "We are literally saving hundreds of thousands of dollars a year," Ward says.

In return, Documentum gets a turnkey solution. Security is built right in, and the software is a snap to use. And iPass provides the same reliable front end no matter what the coverage—dial-up, Wi-Fi or broadband. "The users don't notice a thing," says Ward. "Even when users are on a home wireless LAN, I know the information is secure because iPass is interoperable with VPNs."

In fact, Ward says that when the company recently conducted an intrusion test of its network, "It was iPass that caught the intrusion attempt. It was pretty amazing."

The bottom line, says Lin, is that Documentum now has a better solution, for less money. "I really judge a project's success from how much I don't hear," he says. "I'm not hearing from users about remote access troubles, and I'm not hearing from the CFO about how much we're spending on remote access."

"We are literally saving hundreds of thousands of dollars a year."

— Jeff Ward,
director of IT,
Documentum

these locations while still remaining in compliance with our corporate data security policies."

The iPass Global Broadband Roaming service, which has Wi-Fi connectivity in major airports like Minneapolis-St. Paul, Dallas/Fort Worth, San Jose and Seattle, makes it easy for mobile professionals to ditch the John Grisham novel in favor of getting some real work done.

Q What are the barriers to entry for corporate use of enterprise broadband connectivity?

A Security. "Corporations are rapidly expanding their networks by adding wireless access to their connectivity portfolio," says Matthew Kovar, CFA director, security solutions & services,

The Yankee Group. "The challenge is that by expanding these networks they are increasing the potential vulnerabilities and threats that are inherent in wireless connectivity. iPass' solution will effectively address many of the security concerns with wireless access and with this offering will firmly establish them as visionaries in the industry."

"[Security] is the most significant barrier to entry for many corporations that want to use wireless broadband," says Roy Albert, vice president of product development at iPass. Albert divides security into three areas:

► **Client machine:** The integrity of the laptop in use must be maintained by using a personal firewall and running antivirus software.

► **Authentication:** It's important

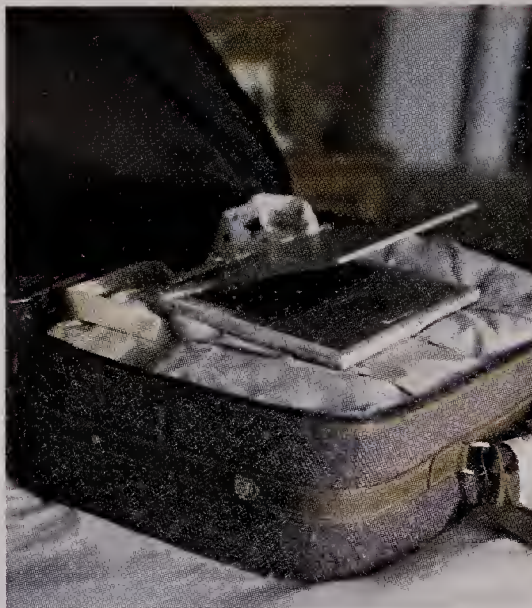
As the mobile workforce grasps the possibilities inherent in wireless broadband, **THEIR DEMAND WILL SWELL FROM A MURMUR TO A ROAR.**

to build in authentication procedures when logging onto Wi-Fi hotspots to defend against unauthorized entrance to corporate networks.

► **Data:** This refers to the necessity of keeping data secure as it moves between a laptop and the corporate network in a roaming environment. Albert says that the best secure method is to use a virtual private network (VPN), which provides an end-to-end secure tunnel for data transfer.

Albert says that iPass addresses all three concerns with its Global Broadband Roaming service. By using iPassConnect—the smart client software that acts as a front end to the service—IT managers can custom-tailor the software to enforce corporate IT policies on wireless connectivity use, thereby managing enterprise wireless use with confidence. For example, iPassConnect ensures that laptops are secure by integrating with VPN software from such major vendors as Cisco, Nortel, Intel, Check Point and Aventail. iPassConnect will automatically launch the VPN when establishing a wireless session.

When it comes to authentication security, iPass has created the de facto industry standard called the Generic Interface Specification (GIS) which provides a standard methodology for letting a smart client, such as iPassConnect, authenticate to disparate wireless service networks. “It’s being adopted fairly well in the industry and will be the common way to have clients doing authentication in hotspots,” says Albert. The GIS utilizes SSL encryption to protect the user’s credentials from being snooped over the air, and iPassConnect contains a



location directory which is used to validate the access gateway’s certificate.

iPassConnect also protects data security by configuring a VPN client to launch only through iPassConnect. If the VPN or personal firewall goes down in the middle of a session, iPassConnect will end the session. “It helps the IT manager protect the machine and corporate data,” says Albert. “That’s not a users’ choice; it’s a CIO choice.”

Hardware. Laptops older than six months or so will require a NIC card to access wireless broadband networks, although the major manufacturers are now bundling them into many of their laptop

lines. “Retrofitting laptops is a minor nuisance for IT support specialists, but once equipped, iPassConnect works with the major vendors,” says Albert.

Finding the Hotspots. While wireless broadband networks are proliferating wildly (In-Stat/MDR estimates that such locations will explode worldwide from 5,199 in 2002 to nearly 42,000 by 2006), most don’t have signs posted to announce the presence of a wireless network to passersby. But iPass, which has aggregated nearly a thousand wired and wireless broadband hotspots, can provide such navigation. iPassConnect

has a phonebook that will tell mobile workers where the hotspots are in any given location. Moreover, iPass has certified their hotspot providers as “Enterprise Ready.” iPass will not add a hotspot to its network without testing it to make sure that it will interoperate with enterprise-mandated systems such as VPNs and personal firewalls.

What if there’s no Wi-Fi to be found? iPass will draw upon its years of experience in dial-up aggregation to provide wireline connectivity.

Q How do I best choose technology for enterprise connectivity?

A Network with peers. Word of mouth is often the best way to get the real information about various services. Similarly, choosing vendors with a proven record of success, such as iPass’ long history with dial-up aggregation, will help winnow out startup companies that could be flameouts within months. And, finally, look for simplicity. iPassConnect acts as a great unifying element, a sort of connectivity middleware that shields corporations from the fragmented nature of global broadband connectivity.

The Final Answer

In the end, as the mobile workforce grasps the possibilities inherent in wireless broadband, their demand will swell from a murmur to a roar. And the smart CIO will take the bull by the horns and manage the issue from the top down. That’s the mission of iPassConnect, says Albert. “We’ll continue to expand the envelope and bring more security and control to the IT executives,” he says. ■

This case study was written by Carol Hildebrand, a business and technology writer based in Wellesley, Mass.

For more information on iPass, view our white paper entitled “Wi-Fi Security for the Enterprise,” available at

www.ipass.com/CIO

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The Magazine for Information Executives

S E C U R I T Y

The Weakest Link

HUMANS ARE THE WEAK LINK in any corporation's carefully crafted security perimeter. That's the prevailing theme of Kevin Mitnick's new book, *The Art of Deception: Controlling the Human Element of Security* (Wiley, October 2002), in which he shares stories of "social-engineering" hacks that involve everything from fake phone calls to dumpster-diving to illustrate how a dedicated and wily hacker can use human fragility and carelessness to crack a network.

Although CIOs may quickly tire of tales highlighting the boundless bravado of hackers, the book does offer some good advice on hardening your employees against such exploits. Mitnick recommends that companies encourage employees to adhere to the following security guidelines.

DO NOT give out any personal or internal company information to anyone, unless their voice is unquestionably recognized and he or she has a need to know. Never disclose your password or any information about your password.

DO NOT download, open or respond to e-mails and files from any unknown source. When in doubt (whether verifying a request for information or opening a file), ask for guidance from the security group.

DO NOT judge a book by its cover. Just because a caller knows the corporate structure and lingo, sounds authoritative or looks the part, doesn't mean she is for real. It's acceptable and expected to challenge authority when there's a security risk at stake.

DO NOT transfer files to people you don't know, even if the destination appears to be within company boundaries.

—Daintry Duffy



E - M A I L P O L I C I E S

You've Got Conversation

RESIDENTS IN THE PORT CITY OF LIVERPOOL, England, speak 60 languages. In its 795-year history, verbal communication has never posed a problem. (Recall that Liverpool's own, The Beatles, sang "She Said, She Said.") But at the Liverpool City Council, the city's largest employer, this knack for yapping had met a formidable foe: the silence of electronic mail.

Internal and outgoing e-mail traffic at the City Council had doubled from 50,000 daily e-mails sent to 100,000 in just the past six months, and city government managers noted that their 19,500 employees throughout scores of city buildings were shying away from face-to-face interaction, relying more on monitor-to-monitor interaction instead.

City officials concluded that something needed to be done. "E-mail traffic has doubled, and employees can simply pass problems on, batting them off into cyberspace instead of taking care of them," says council Chief Executive David Henshaw. "There is a need for accountability."

On July 10, the city instituted an e-mail ban on Wednesdays. Urgent messages and attachments can still be sent electronically, but workers were instructed to avoid asking questions, setting up meetings or even participating in idle chitchat over e-mail. Instead, they were directed to pick up the phone or—get this—stand up and talk to the person face-to-face. "The idea is not about establishing an e-mail police but rather to get people to think before they send e-mails," says Paul Johnston, a city spokesman. "People are exchanging e-mails with coworkers who sit only six feet away."

Wednesdays are a bit more vibrant around the office since the e-mail ban, despite some initial worker skepticism. The e-message count that day is down about 70 percent. Phones are ringing more often. Hallway traffic is appearing.

As for the rest of the week? Traffic has stayed steady at 100,000 e-mails sent daily. Surprisingly, Henshaw says the city hasn't seen any inbox buildup on Tuesdays or Thursdays, and there is even anecdotal evidence that suggests productivity has risen on Wednesdays. "The full inbox has become the new oppressor in the workplace," says Henshaw. "We embrace technology here, but we won't let it take over."

—Daniel J. Horgan



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Washington Watch

Edited by Elana Varon

Financial Rules May Promote E-Business Investments

CIOs WHO ARE STILL struggling to get their company to invest in e-business systems have a new line of argument: Doing business online can keep executives out of jail. New Securities and Exchange Commission (SEC) rules against corporate fraud give large public companies less time to report key information to investors. Theoretically, at least, companies that keep their most important records in electronic form will find it easier to comply with the government's requirements.

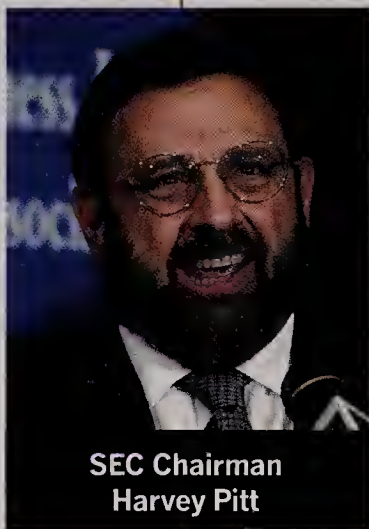
The rules require companies to file their 8K forms disclosing material events within two days of a major transaction, such as

the sale or purchase of a major asset or the cancellation of business with a key customer. Currently, companies have at least five business days to file such reports.

The SEC believes that two days will give dishonest executives less time to hide their misdeeds. But honest companies will be forced to scramble to enter data about paper-based transactions into the systems that generate their financial reports. Without that data, the reports won't

be accurate, and if CEOs approve inaccurate reports, they're supposed to go to jail.

Unfortunately, hardly any company has



SEC Chairman
Harvey Pitt

entirely eliminated paper. According to a recent study by Plano, Texas-based management consultancy A.T. Kearney, only 11 percent of companies' total spending is documented electronically at the time of the transaction.

But the new rules will force companies to report even a glitch in the supply chain, such as a major supplier running out of inventory, if it affects production. That's a problem A.T. Kearney contends most companies don't have the technology to spot.

Jim Walker, senior analyst with Cambridge, Mass.-based Forrester Research, says that eventually, vendors will sell audit applications that compile financial and transactional information for disclosure reports from e-business systems. But before CIOs can deploy it, they must have more data available electronically.

The message—that investing in e-business systems can help the bottom line—is an old one. Now there's an argument that's easy to understand.

—Ben Worthen

TECH-SAVVY ON CAPITOL HILL

The congressional Internet Caucus boasts almost 200 members, but only a few of them get their hands dirty making IT policy. What makes a tech-savvy representative or senator? He or she has learned how IT works. Of the approximately 400 House members and 31 senators running for reelection on Nov. 5, here are three that are IT experts.

Rep. Tom Davis (R-Va.) First elected in 1994, Davis was once vice president and general counsel at McLean, Va.-based systems integrator PRC, and

his suburban Washington, D.C., district is home to numerous federal IT contractors. He knows government agency information systems and information security. He chairs the Government Reform Subcommittee on Technology and Procurement Policy. Davis has sponsored bills to promote e-commerce standards and improve IT worker training.

Rep. Billy Tauzin (R-La.) Chairman of the House Commerce Committee, Tauzin is the most powerful IT policy player in the House. The 12-term

lawmaker puts his stamp on every telecommunications-related bill. He's championed consumer privacy but has put the most energy recently into his Internet Freedom and Broadband Deployment Act, which would expand the nation's high-speed Internet infrastructure (see Washington Watch, Aug. 15, 2002).

Sen. Jay Rockefeller (D-W.Va.) A senator since 1984, Rockefeller, a former West Virginia governor, has been at the forefront of IT policy since the Internet boom in the mid-



Rep. Tom Davis

'90s. In 1996, he shepherded through the Senate the Clinton administration's E-Rate grant program to wire public schools, and he's still a leading advocate of the program. He's against taxing Internet access, but in favor of taxing online sales.

—B.W.

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INNOVATION

The \$5,000 Scooter (Batteries Included)

MEMO TO PR: All the free media hype and political goodwill you can muster doesn't guarantee your product offering will sell like Gameboys when it hits the market.

Nearly a year has passed since entrepreneur Dean Kamen unveiled the Segway, a zero-pollution 83-pound self-balancing battery-operated scooter that putts along at a max speed of 12.5 miles per hour and lists for \$5,000. But the contraption (once nicknamed Ginger) that looks like a monster pogo stick riding on two wheels hasn't become an urban commuter's vehicle of choice since it started selling last December.

Kamen's dream of transforming the way we get around hasn't materialized yet. For one thing, Segway's business plan called for rolling out the scooters to commercial customers first. The U.S. Postal Service, GE Plastics and the Atlanta Regional Commission are a few that have bought Segways (the company does not release sales figures).

The success of the Manchester, N.H.-based company, also called Segway, will depend on how many more units these

kinds of organizations end up buying, says Marketing Director Tobe Cohen. The company plans to offer limited public test drives in early 2003, although its original launch was scheduled for fall 2002.

Segway's success on the regulatory front, meanwhile, is moving at warp speed. So far, 31 states have passed laws allowing the devices on walkways, according to Segway. In March, U.S. Sen. Robert Smith (R-N.H.) introduced a bill that allows them on federally funded sidewalks. It awaits a Senate vote.

Back to the scooters. The Segway can carry a user weighing up to 250 pounds plus 75 pounds of cargo. Using gyroscopes and tilt sensors, the Segway's speed and direction is based on the rider's movements; when he leans forward, the vehicle moves forward, and if he pulls back, it stops.

Segway Project Manager Bob McCord of the Atlanta Regional Commission, a Georgia planning agency, says his group has saved time using its two Segways to travel to meetings and run errands downtown. The things still cause a rubberneck effect when McCord



Have you seen one of these scooters in action? Probably not.

or his coworkers ride around Atlanta. "We get a variety of reactions," McCord says. "A lot of people start to get worked up when they see it, wondering, Hey, where can I get one of those?"

—Sarah Johnson

WEB STRATEGIES

If You Play, You Pay

THESE DAYS, freebies are few and far between in football fantasyland. Games and services on the Web are increasingly coming with a price tag. Over the past few years, the Pittsburgh League, an eight-team fantasy football league (this writer, a team owner, calls the shots from Boston), has hopped from RotoWire to SportsLine and now Yahoo in search of free fantasy field time.

After offering its service for free the last two seasons, SportsLine.com is now charging \$139.95 per league for its Web-based fantasy league management package called Football Commissioner. Peter Pezaris, vice president of product development at the Fort Lauderdale, Fla.-based sports media company, says the com-

pany generated \$1.5 million with its fee-based fantasy baseball product in the summer. He expects football—its bread-and-butter product—to beat that two or three times over. He realizes, however, that many of SportsLine's 4 million registered users would rather sit on the sidelines than pony up. "The reality is that when you go from free to paid, you're going to have some attrition," Pezaris says. "If we retain anywhere near 50 percent, we'll be very pleased."

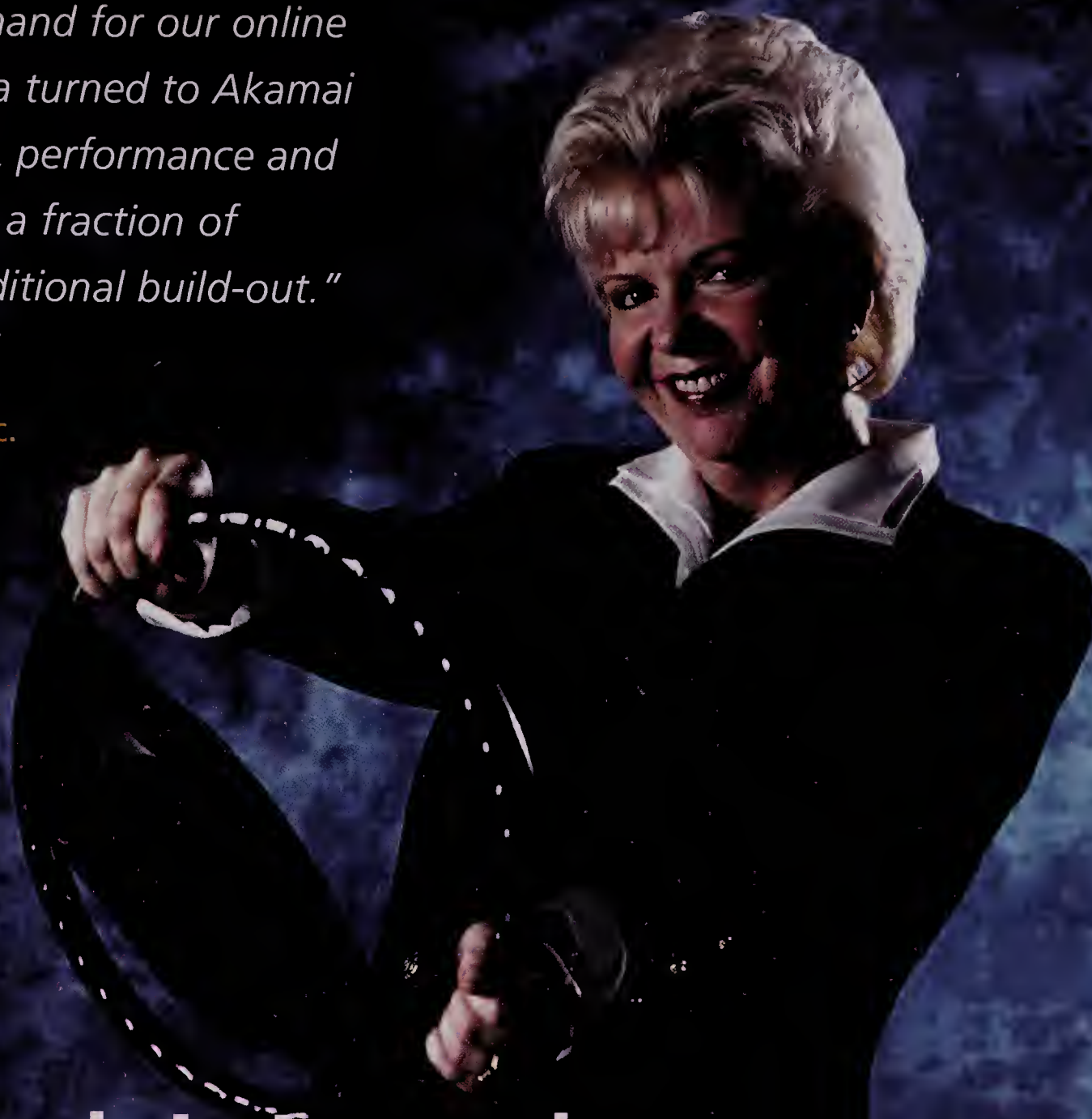
Many sites such as Sportingnews.com offer tiered services, says Erik Barmack, general manager for fantasy sports at The Sporting News. The hope is that features like live scoring and newsletters will attract more paid customers. "The business value is having that person move up to a premium-level game, play it, like it and then keep him in the system for many seasons," Barmack says.

Fantasy players have to recognize that free sites are becoming a thing of the past, according to Michael Nazarek, owner, publisher and webmaster for FFMastermind.com, a website dedicated to fantasy news and advice that offers subscription-based services. "The days of free fantasy football on the Web are dwindling," Nazarek says. "If you're not willing to pay \$10 to \$12 per team for a site to run your league, that's just plain cheap."

—Jon Surmacz

To meet ever-increasing demand for our online products and services, Toyota turned to Akamai to instantly extend the scale, performance and reach of its infrastructure at a fraction of the cost associated with traditional build-out."

—Barbra Cooper
Group Vice President and CIO
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Total Leadership

Leadership from Below

Tap into talent at all levels of the organization

BY PATRICIA WALLINGTON

SOME SAY THAT leadership always starts at the top. But does it end with the CEO? I don't think so. Leadership skills can be found at all levels of an organization. You can—and should—exhibit leadership to influence those at the top of your company.

Consider this scenario. You are in a meeting that seems to be in a perpetual spin cycle. No one seems to know what will move the situation forward. You know what needs to be done—but you are the most junior member of the team. Should you speak up?

Of course. But before you leap to your feet and grab the pen, consider how to be most effective when you are attempting to lead from below.

Cultural Permission

Assess what your corporate culture supports or allows. Is it customary for even the low man on the totem pole to be viewed as an equal in senior meetings? Watch the reactions when you do speak out. Are heads nodding assent or is there a loud silence? This will help you gauge whether and whom you can count on for support.



My advice to CIOs: Speak even if nervous. Your technology currency may make your ideas more relevant to the solution. Your active participation can begin to shape a culture of openness that will benefit everyone. Rather than curbing your leadership, focus on finding the effective way to participate.

Prepare the Way

Develop a relationship with key senior leaders. Choose them based on their influence rather than their position. Find the casual environments where people let their guard down. Learn from them and share your knowledge at the same time. Those relationships will provide the foundation of support for your leadership no matter how senior the meeting or controversial the issue.

Engage in a dialogue that facilitates seeding your ideas with those key decision makers. Sometimes you can share an idea with a senior person and let him be the sword bearer.

ILLUSTRATION BY JAMES O'BRIEN

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Total Leadership

Pick Your Spots

Not every issue is a candidate for leadership from below. Consider the value you bring to each question. Is the company about to make a strategic error? Do you have extensive knowledge of the subject? You will either build political capital or expend it as you proceed, so it behooves you to act with that in mind.

As the most junior member of a company's Strategic Planning Task Force, I was faced with a challenging situation. The group's final task called for each member to present to the CEO a future business scenario she thought most likely (in 10

Leading from below is a high-wire act that requires almost bipolar behavior—courage and confidence balanced by humility, assertiveness yet deference.

minutes). The scenario I put forward was radically different from all the others.

There were compelling issues facing the company in both the short and long terms. The other scenarios, in my view, would not affect the necessary change in the requisite window of time. Technology was changing the business much faster than the other executives recognized. In the discussion that followed, I played out example after example of the risks of not adopting an aggressive plan, feeling much like Henry Fonda in *Twelve Angry Men*.

In the end, the consensus position was a hybrid, but one that was more aggressive than if I had remained passive. This issue was a good candidate for me to show leadership because the future viability of the company was at stake, and my technology role gave me a clear view of the alternatives and risks.

Judge Not

Try not to be judgmental about leadership. Thinking that you always have the best answer or approach is a sure path to career disaster. There can be so many reasons why the right leadership hasn't surfaced above you. Big issues may distract top executives. They may fear showing their lack of specific knowledge (especially if it is a technology issue). The ghosts of former failures may haunt them. Whatever the reason, it creates a prize opportunity for you to demonstrate leadership.

There are many ways to influence the senior leaders of your company. The key to success is finding the way to push the envelope without losing your credibility. Be sure your behavior fits the occasion. Leading from below is a high-wire act that requires almost bipolar behavior—courage and confidence balanced by humility, assertiveness yet deference. Freely share the credit for success. It may take a little practice but it will pay dividends.

One time I pushed the envelope aggressively, only to be called to task by the company president. I pitched my approach to him as hard as I knew how. Finally, I got a note of what I interpreted as approval: "You have my support to proceed at your own risk." Interpretation: If it works, he takes the credit; if it fails, the blame is mine. I did it anyway. It worked.

Grow Your Own Leadership

While you work on influencing the senior leadership of your company, set the stage for your own IS group. Find ways to recognize and nurture the emerging leadership deep in the organization.

How do you uncover the hidden talent in the organization? Get to know the people yourself. While that isn't always possible in large organizations, you should try to get to know as many as possible. This is how you find out about the leadership people exert in their personal lives. The one who led the effort to build the new town football stadium, the president of a professional association, the leader in a political campaign. These are natural leaders hungry for the opportunity to use their skills at work.

Do all eyes of your staff turn to you every time there is an issue? You have work to do to encourage the leadership below. Try the following behaviors:

- Solicit employees' ideas and encourage participation in important discussions.
- Learn to speak *after* others have given their thoughts. The boss's words can stifle other input.
- Never disparage what went before, even if you disagree with it. Try to build on others' ideas rather than knock them down. Fear of embarrassment is a powerful demotivator.
- Provide positive feedback and recognition to those who demonstrate leadership.
- Let others lead. Show the way by restraining your own drive to lead and being a supportive follower.
- Use failures to teach. Experience is the best teacher and failure the consummate coach. Without support from above and the ability to learn from mistakes, people will avoid risk-taking.

Whether nurturing the emerging IT leadership or having the courage to demonstrate your own leadership in senior executive circles, know that you are contributing to the ultimate success of your company. **CIO**

How have you led from below? Let us know at leadership@cio.com. Before retiring in 1999, Patricia Wallington was corporate vice president and CIO at Xerox. She is now president of CIO Associates in Sarasota, Fla.



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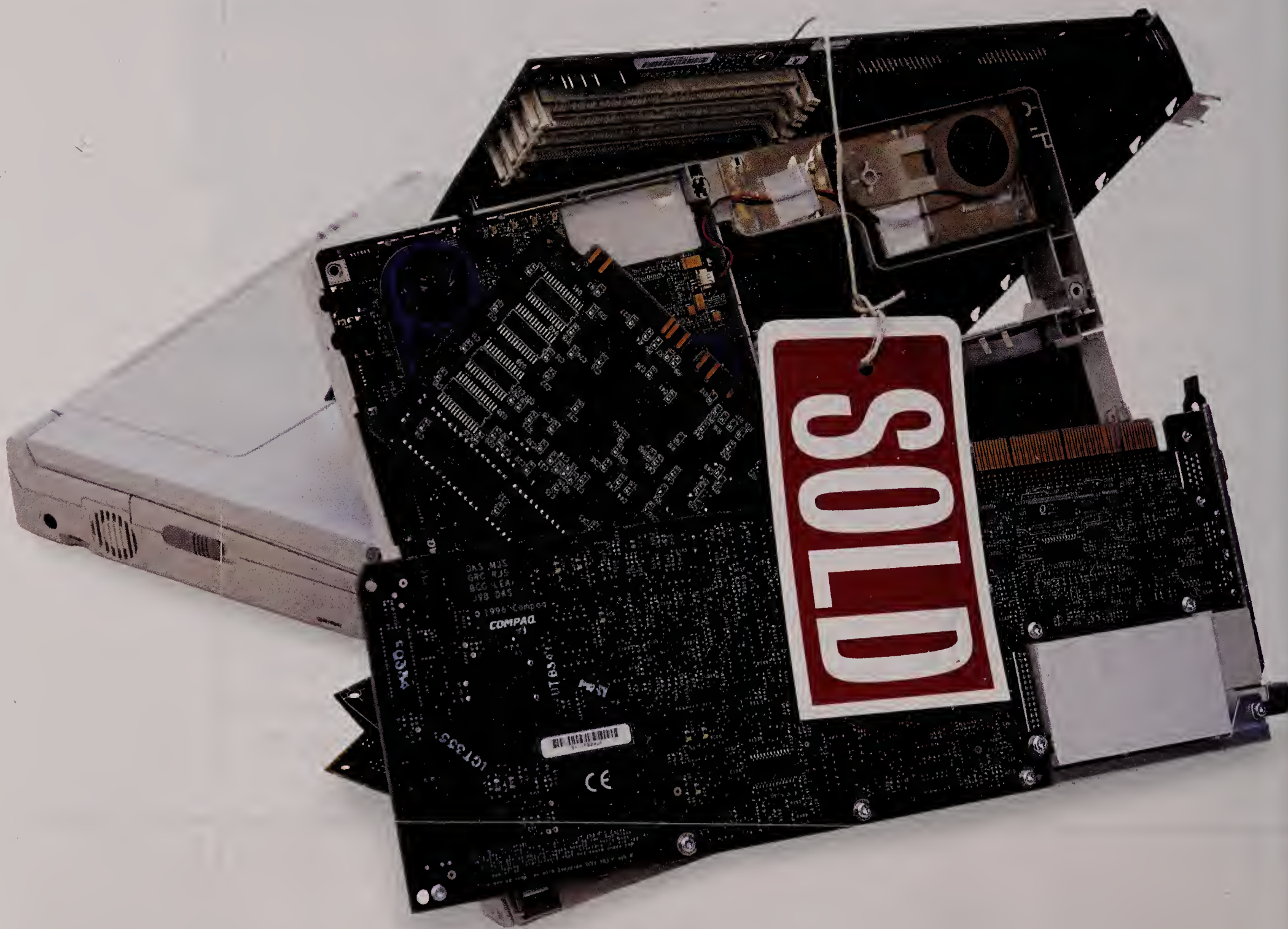
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Good Stuff Cheap



A new hardware market is developing to give CIOs what they want most: good stuff cheap. This is its story.

BY SCOTT BERINATO

IN THE EARLY 1970s, when the government, as part of a lengthy antitrust action, forced IBM to sell equipment and not just rent it, companies such as Comdisco and Forsythe-Macarthur bought IBM S360s and entered the leasing business. Thus, the secondary marketplace—where used hardware is bought and sold—was born. It was a niche business, and it stayed that way for 25 years. Until everyone lost his mind.

That was about five years ago. Flush with Internet cash, CIOs stocked up, buying a server for every application. With Y2K looming, they bought backups too. With the Web, there was no such thing as too much storage or networking capacity. Demand was massive, and supply strained to keep up.

Then, overnight, demand vanished. Companies that had been buying hardware in bulk—mainly telecoms and dotcoms—went out of business. Other companies decapitated their IT budgets and started consolidating servers and data centers. Most also decided that their old servers were good enough. Who needed the new new thing? Leases ended on a startling amount of equipment.

Put it all together, and you get a sudden and unprecedented surplus of perfectly good routers, switches, disks, servers, PCs and notebooks.

There is so much used hardware available

now—and so much emphasis on cutting costs—that the secondary market is no longer a niche business. Nor does it appear to be a transient, post-boom phenomenon. Experts point to four factors to support this assertion: **1.** chips don't wear out like automobile engines, meaning this gear will be marketable for years to come; **2.** the sheer volume of hardware created during the late '90s can support the secondary market for years (consider that a startup, MicroCast, earned \$880,000 in revenue between 1999 and 2000, filed Chapter 11 in late 2000 and left behind hardware valued at \$40 million); **3.** once buyers get used to wholesale prices, it's unlikely they'll willingly go back to buying retail; **4.** the services developing to support the secondary market are making it easier and less frightening for buyers to participate. Soon CIOs won't be able to imagine *not* having the option to buy used.

This is a complex market. You can buy from brokers or tweeners or vendors. Or eBay. There are license transfers, inspection fees and third-party maintenance options. There's disposition to think about. (How do you throw this stuff out without running afoul of the Environmental Protection Agency?) Just learning the lingo is a chore. (See "The Secondary Market: A Glossary," on Page 58.) But as CIOs of enterprises both large and small are currently learning, the rewards for diving into the secondary market can be great.

Here, then, is CIO's tour of the secondary market—its characters, its characteristics, the products and the prices that are insane!

Reader ROI

- ▶ How the secondary market can save you money
- ▶ The lowdown on the players and lingo of this world
- ▶ How to mitigate the risk of buying used gear

The Buyers

WHY THE CEO LOVES BILL HASER

BILL HASER might be bragging a little bit, but he has a right to. "In two years, we've driven out about a quarter of our operational costs," says the CIO of Tenneco Automotive, a \$3.5 billion auto parts manufacturer in Lake Forest, Ill. "I told a CIO about that, and he thought I was joking. I'm not. The savings have been very substantial, and the chairman has recognized us for it. A large part of that savings has been leveraging the secondary market."

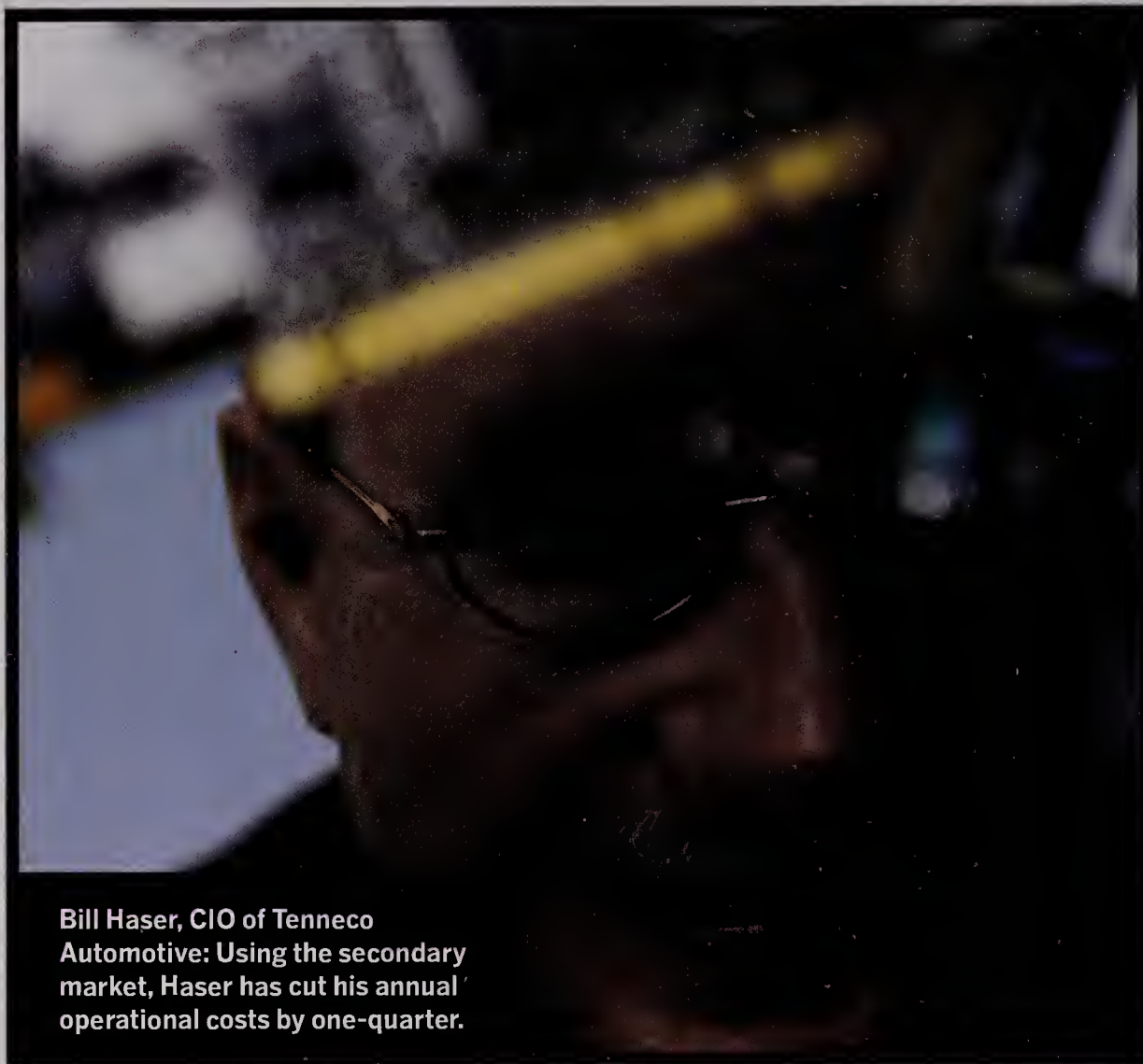
Haser is in a minority *and* a majority here. He's in a minority because he is one of only a few CIOs willing to speak on the record about the secondary market. Either through some sort of hand-me-down shame or maybe to protect relationships with vendors, many CIOs aren't.

But Haser is in a majority because, as he says, "Everyone is doing it."

Indeed, according to a recent CIO survey of 187 information executives, 77 percent are purchasing secondary market equipment, and 46 percent expect to increase their spending in that area next year by an average of 15 percent. (To see the entire survey, go to "Second-Hand IT" at www.cio.com/printlinks.)

Forty-one percent cited lower capital costs as their primary reason for going used, which isn't surprising. The economics of used gear is hard to ignore. Samuel Brooks, MIS director of Keystone Property Management in Mount Pleasant, Mich., relies on the used market to get equipment he says he otherwise couldn't afford. His most recent deal was a \$10,000 Dell file server that he got for \$3,000. Asked if his chairman recognized him, the way Haser's had, Brooks says, "Nope. Now that they see this channel, they *expect* me to be there."

Even more significant, 30 percent of survey respondents said that they're there because the performance of new equipment



Bill Haser, CIO of Tenneco Automotive: Using the secondary market, Haser has cut his annual operational costs by one-quarter.

simply doesn't justify its expense. Last year's hardware, it seems, will run this year's applications perfectly well.

Haser says that he had assumed that the secondary market was littered with Jurassic

hardware that wouldn't support his applications. Instead, he's buying used gear to support an SAP upgrade.

"We'll always look at this market as an option from here on in," Haser says.

The Brokers

CRAZY JOHN. HIS PRICES ARE INSANE!!!

MEET JOHN LYNCH. Has he got a deal for you!

How about a Cisco 12000, fully loaded, for 12 grand? Or a \$55,000 Sun StorEdge 9X73 657 GB T3 Array, new in the box. Lynch'll sell it to you for seventeen-five. There's no reason, he says, to pay exorbi-

tant prices for new hardware when there's so much good used gear to be had.

"There's \$350 million of stuff at Enron. We just picked up half of it.

"Hold on," he says, taking another call. He returns without missing a beat. "Sorry. Williams is another telecom that put

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\$247 million in gear out there. I've purchased over 200 midrange Compaq servers in the last two weeks, and I'll get \$12 million more in Cisco gear in the next two weeks.

"Hold on," he says.

Lynch, 46, is CEO of Asset Recovery Center (ARC), one of the largest companies on the secondary market. ARC will take in about \$50 million this year, up from \$1 million two years ago. Lynch believes that the top line will grow to \$100 million next year. At any given

years since the days when "10MB hard drives weighed 120 pounds." He got his start when, as he was eating an Italian combo sub on a loading dock, he saw some Digital equipment nearby, waiting to be scrapped. The next day he put on a tie, bought the lot and turned it around for \$98,000, four times his annual salary at a company called Associated Food, where he ran the cash-and-carry division.

The fact that Lynch is both knowledgeable and colorful has landed him on NBC, in

Fortune magazine and at the dais lecturing hundreds of Wall Street's heaviest heavy-weights. He has become the public face of the secondary market, and it's a face that has struck fear into hardware vendors watching their customers being lured away by the titillatingly low prices Lynch and his ilk can offer.

"You'll save money just by entertaining me," says Richard Hart, who owns used hardware vendor H and H Technologies in Hickory, N.C. "Tell a vendor you're looking at used gear, and they'll start cutting their prices immediately. You're foolish not to at least inquire."

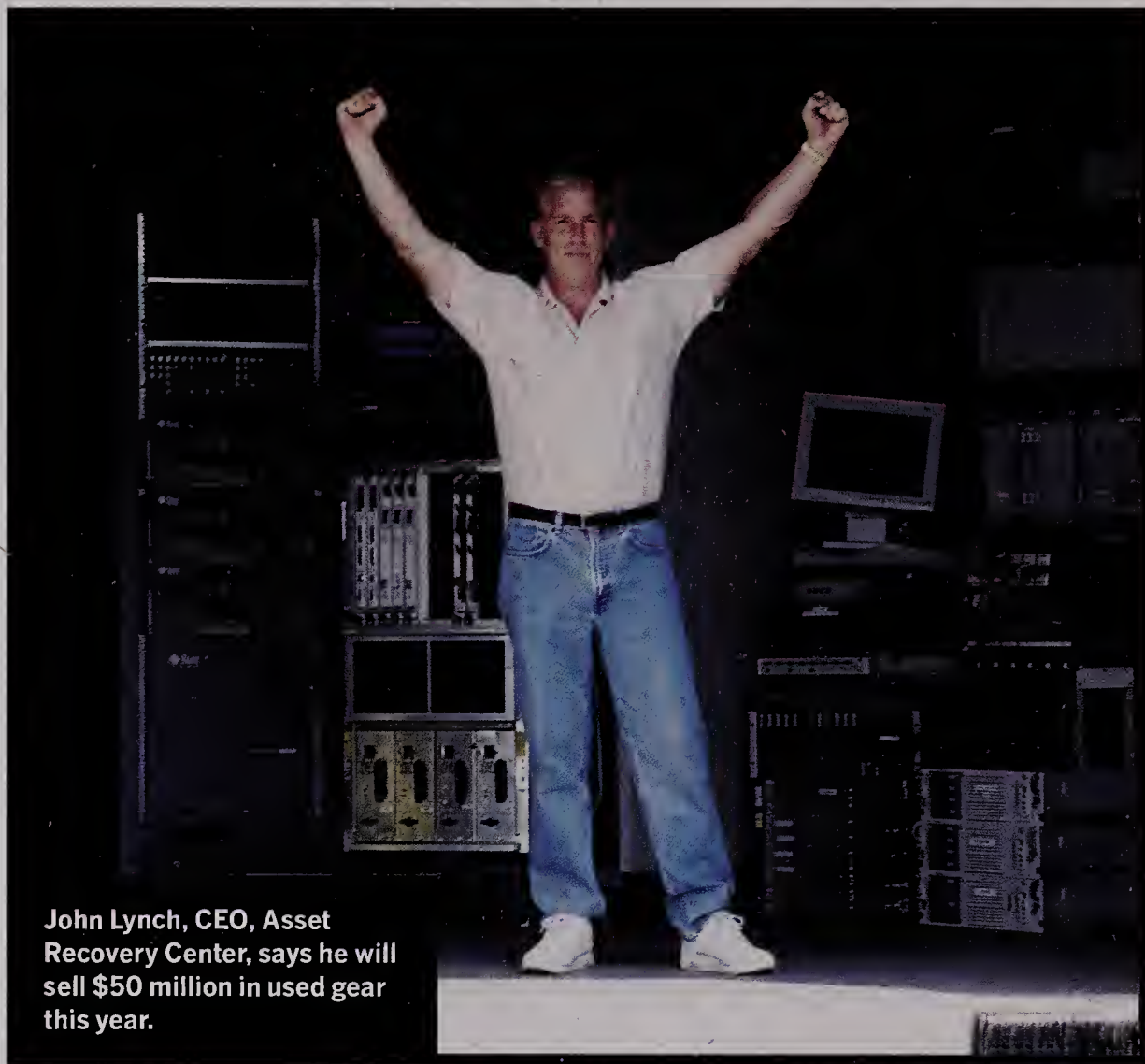
Brokers range from small-time entrepreneurs such as Hart to websites like Used-router.com to large outfits like ARC and Optimus Solutions, a \$125 million company.

Brokers will trade 10 servers for five routers. If you ask them to, they'll hunt down a hard-to-find storage device. If you want, they'll rent you hardware. Everything's available. Everything's negotiable.

Many buyers find this refreshing. Mainstream vendors can often seem unfriendly and downright stodgy next to a guy who's willing to knock off 10 grand if you'll trade in that pile of laptops in the closet.

"I'm on my way to our warehouse now," Lynch says. "I've got four MCI reps coming in looking to off-load some equipment. I sold a million-six of Cisco 6509s to Credit Suisse First Boston. I'm working a deal with Qwest. They're trying to get rid of a whole warehouse of goods. It's worth \$50 million. They want \$22 mill. I'm offering \$9 million."

"Hold on...."



John Lynch, CEO, Asset Recovery Center, says he will sell \$50 million in used gear this year.

time, there's about \$80 million worth of used gear in its Eatontown, N.J., warehouse.

That is in part due to Lynch. His brassy Jersey accent seems to put everything he says into italics. Someone else might say, "That sale was worth about \$1 million." Lynch says, "I picked up a million and change on that *deal*." Lynch's strength (as he'll agree) is his ability to foresee the secondary market's ebbs and flows—which products will be in demand and which will just take up space in his warehouse. He's been doing this for 25

The Vendors [PART 1] IN DENIAL

IT'S NO FUN competing against yourself, trying to sell this year's server for \$10,000 while some wheeler-dealer is hawking last year's server (which is really just as good) for \$3,000. This dynamic has divided the vendor community into two groups:

those learning to live with the secondary market and those in denial.

You can see the denial in how some sales reps will try to make a sale.

First, they will question the provenance of the hardware. They might suggest that

the broker is selling "gray market" equipment, meaning it might contain illegal parts, and wouldn't the buyer be better off buying a server that a big vendor stands behind?

Lynch at ARC says Cisco sales reps told a prospective buyer that it would be "unpatriotic" to buy from Lynch and suggested that the hardware Lynch was selling was "contaminated" with asbestos dust because it had come from offices near the World Trade Center. (About \$10 million in gear was recovered from the WTC site. Lynch confirms that the hardware he was selling in this deal came from there but denies that it was contaminated and denies being unpatriotic.)

Says a Cisco spokesperson, "Customer satisfaction is a core value of Cisco's culture. Any behavior that doesn't support this value is unacceptable."

There are other ways to make purchasing on the secondary market less appealing.

"I've got EMC stuff, still in the box, still sealed shut with EMC tape," says Jeff Archuleta, who owns secondary vendor Arch Consulting in Sandy, Utah. "It's in perfect condition. And EMC is telling the buyer it has to be recertified for eight grand before the buyer can get a support contract."

Greg Winner, CIO of real estate firm Hamilton Partners in Chicago, called his Cisco sales rep to inquire about license transfers and support on a large volume of Catalyst 5500 switches and VXR 7200 routers from companies that had filed Chapter 11. He was going to use them to offer high-speed access to Hamilton Partners tenants. The sales rep told Winner that before Cisco would agree to support the gear, it would have to inspect it. That would cost as much as \$6,000 for each piece of used equipment. Furthermore, Winner would have to buy new software licenses for as much as \$3,150 per year per unit.

"This is like GM asking for a royalty when I buy a used car," Winner says.

CIO.COM See **SECOND-HAND I.T.**, the complete survey of CIOs on their use of the used IT hardware market, at www.cio.com/printlinks.

4 RULES FOR WORKING THE SECONDARY MARKET

DO YOUR HOMEWORK. Know exactly what kind of gear you want. "There's one version of the Cisco 5300 switch that supports simultaneous phone calls and one that doesn't," says R. Todd Wallace, CTO of Irving, Texas-based IPOperations, which uses and sells secondary market gear. "The way you know this is to know there's a revision number on one and it uses a different chip set."

USE AUCTION SITES. Even if you don't want to bid, use the sites to get a sense of the going price.

BARGAIN. "The key to this whole market is moving gear fast," says Af Assur, director of global remarketing for IBM's Global Asset Recovery Services. Secondary sellers don't want to get stuck. That gives you an advantage. Don't accept the dealer's first price. Use your old gear as a trade-in. Barter. The longer you go, the more the price will come down. Just don't go too long or make offers that are unreasonable—there are other buyers.

USE YOUR HEAD. If it sounds too good to be true, it just might be. One buyer reports getting \$4,000 storage devices for \$400 apiece. They worked. Another ended up with flood-damaged servers. They didn't work, and there was no recourse. Seek out the great deals, but also trust your instincts.

—S.B.

If the buyer is still leaning toward purchasing used equipment, the sales rep can play his trump card: He can say his company will not be able to provide support. That happened to Tim DuBose, who owns Riverside Technology Group in Riverside, Calif. He was selling \$1.6 million worth of high-end Sun servers to a large company, but says the buyer dropped out after Sun said it could not support them.

Brokers say that nine out of 10 times the support ploy is a bluff. But it's a good one. No one wants unsupported gear. Still, CIOs and brokers say that if the buyer calls the bluff, the sales reps will start trying to sell services, or they'll cut the price on new gear.

Ultimately, that kind of aggressive selling is myopic, argues Eric Johnson, associate professor at the Tuck School of Business at Dartmouth University in Hanover, N.H. Vendors may grab back some business in the short term, but already third-party companies are stepping up to offer alternative

maintenance contracts, and some brokers are getting into the support business.

What the big vendors should concentrate on, says Johnson, is safeguarding their relationship with their customers, not protecting next week's sales.

Vendors are beginning to get this to varying degrees. IBM's Global Financing division, which includes both leasing and used sales, accounted for 10 percent of IBM's 2001 profits. Forty percent of Hewlett-Packard's Financial Services division revenue last year came from the secondary market. Dell's revenue from used gear went from zero in 1999 to \$200 million last year. Cisco set up the Cisco Authorized Refurbished Equipment (CARE) program in 2000. But unlike Dell, HP and IBM, Cisco does not maintain a storefront on eBay, which those vendors use as a primary marketing channel. And a Cisco spokesperson says, "We do not see the used market as significant in terms of its impact on our business."

The Vendors [PART 2]

LEARNING TO LOVE THE SECONDARY MARKET

SELLING USED GEAR may seem to be at odds with being the original manufacturer, but maybe it's an opportunity," says John Sheaffer, CEO of Westmont, Ill.-based Sysix, which sells both new and used gear. "Hey, margin is margin. Money is what matters. Like it or not, this market is in play."

Irv Rothman gets it. "If you don't control the secondary market for yourself, someone else will," says Rothman, CEO of HP Financial Services. "And they *will* use your equipment against you."

To prevent that, HPFS's Andover, Mass., office has 470,000 square feet of offices and storage space and labs and parts shops and loading docks that operate around the clock, taking in leased and repossessed equipment for a lavish technical wash and wax. Refurbishing used gear includes wiping hard drives, replacing components, testing chips, restoring basic configurations and sucking the dust out of a system. At any given moment, HPFS has 50,000 used assets here. Half-a-million pass through in a year. Skids hold yellowed, junky monitors that will soon meet an environmentally conscious death. There are pallets stacked with notebooks like giant plates of nachos. In the back, 45,000 square feet of warehoused gear is stacked to the ceiling, waiting to ship out to HP's services group, or to brokers, or to a CIO who got herself a deal on a 20-year-old VAX system.

The Andover facility (it was Compaq's before the merger) didn't exist six years ago. IBM has built 20 refurb houses worldwide, taking in 15,000 assets a week. These vendors are not in denial; they're taking the brokers on.

In general, vendors can't beat brokers on price because their overhead is much higher. But vendors do have certain advantages. Trusted brands. Deep knowledge of the systems. Extensive services groups to support

the gear. Dealing with the vendor directly certainly provides the least complicated license transfer and maintenance contract transfer process. This is where the secondary market is going. "I'll pay a little more and

mine the value of used gear—whether, say, it's more valuable in parts than as a whole. "We have tuned the demand," says Af Assur, IBM's director of global remarketing for Global Asset Recovery Services, which is part of IBM Global Financing, the leasing group. "We know the inflow and outflow about two months in advance, so we plan and know exactly what to do with the asset when it comes in."

It has been a coldly corporate ramp-up,

If you don't control the secondary market for yourself, someone else will. And they *will* use your equipment against you.

—IRV ROTHMAN, CEO, HP FINANCIAL SERVICES

deal directly with the vendor rather than pay a lot less and go through a broker," says Brooks, Keystone Property's CIO.

The vendors are as scientific about the secondary market as the brokers are seat-of-the-pants. HP's warehouse is entirely automated. There are equations that deter-

which is why Rothman thinks fewer people know about his business than they do Lynch's. "It's not as sexy a story as, you know, some broker-making-millions story," Rothman says. "Look, 40 percent of our [division's] revenue is from the secondary market. That's a big number."

THE SECONDARY MARKET: A GLOSSARY

Bubble gear: Gear from bankrupt companies.

Distributor overstock: The clearance rack. Equal-to-new gear sold cheap to fulfill quotas.

Equal-to-new: Lightly used hardware.

Floor models, demos or lab gear: Hardware used for testing or demonstration but never deployed.

Off-lease: Hardware resold after a lessee returns it.

Refurbished or refurb: Slightly reworked gear, for example, fans or power supplies replaced before resale.

Remanufactured or remand: Completely reworked hardware, for example, memory or hard drives added.

Remarketed: Refurb or remand gear being resold by the original vendor.

Used: General term for most secondary hardware.

Vintage: Out-of-production hardware such as VAX systems.

White box: Clone equipment. Not truly secondary market but lumped in because of its low price.

—S.B.

HOW BIG IS IT?

In fact, no one knows the size of the secondary market. But everyone knows it's getting bigger all the time.

T NO POINT IN THIS STORY do we estimate the size of the secondary market. There is a reason. No one knows what it is.

The secondary market is complex. To estimate its size, data would have to be culled from manufacturers, lessors, resellers, brokers and auction websites about gear that is used, equal-to-new, refurbished, remanufactured, slightly damaged and lost.

There's just too much used gear in too many places. And it moves too fast. Tweeners—brokers who sell used gear to other brokers—sometimes move equipment a half hour after buying it.

>> Insiders bandy the number \$20 billion, but that's less precise than a wild guess. This much we know: The secondary market is big and getting bigger.

>> Secondary gear dealer Asset Recovery Center has grown from \$1 million in revenue to almost \$50 million in three years, according to CEO John Lynch. Another company, Optimus, expects to grow 25 percent year-over-year, from \$100 million to \$125 million this year.

>> Six of *Inc* magazine's 500 fastest-growing private

companies in America of 2001 sold used gear.

>> The number of listings on eBay for secondary net-working hardware is about 25,000 at any given moment. It rose 98 percent in 2001, 150 percent in the past year and a half, making it eBay's fastest-growing section.

>> HP Financial Services expects to move 1.5 million units on the secondary market this year, and secondary market activity accounts for roughly 40 percent of HPFS's \$3.5 billion revenue.

>> IBM's Global Asset Recovery Services receives 780,000 off-lease units per year, most of which go into the secondary market.

>> Dell Financial Services sold 300,000 pieces of used equipment in the past year and expects that number to rise.

>> While manufacturers used to ignore used gear buyers unless they were doing deals in the six- or seven-figure range, they'll now compete tooth and nail for deals as low as \$70,000, according to several CIOs and brokers.

—S.B.

The Market WHO SETS THE PRICE?

PARADOXICALLY, the complexity of the secondary market was spun out of the simplest notion: supply and demand. When demand ruled, so did vendors. They set prices; they determined the value, or lack thereof, of used gear. Now supply rules, and CIOs have a great opportunity to grab the power to define value.

HP's Rothman calls it the law of the jungle. ARC's Lynch calls it the American way.

Malcolm Fields, CIO at Hon Industries, a \$1.8 billion office furniture manufacturer in

Muscatine, Iowa, calls it his fiduciary responsibility. Fields is a self-described tightwad. He says that recently his units have fallen in love with the secondary market because demonstrating ROI is a cinch when capital costs can be reduced.

"We've started browsing the hardware section of eBay. I've bought gear on there three or four times," says Fields. "We'll search on a type of equipment just to get a sense of the market. Then we typically buy from smaller, independent players, direct.

We insist on strong warranties."

Fields, like Haser at Tenneco, was impressed by the amount of good stuff he's found. Like Haser, he was happy to discover that more and more services are supporting the market. Like Haser, his company is noticing his effort to reduce costs. "I've already saved us hundreds of thousands," he says.

And, like Haser, Fields has found a new way to do his job. He's setting a price, and the market moves to meet it. That's a big change. And change is good. Especially for CIOs. **CIO**

E-mail Senior Writer Scott Berinato at sberinato@cio.com.

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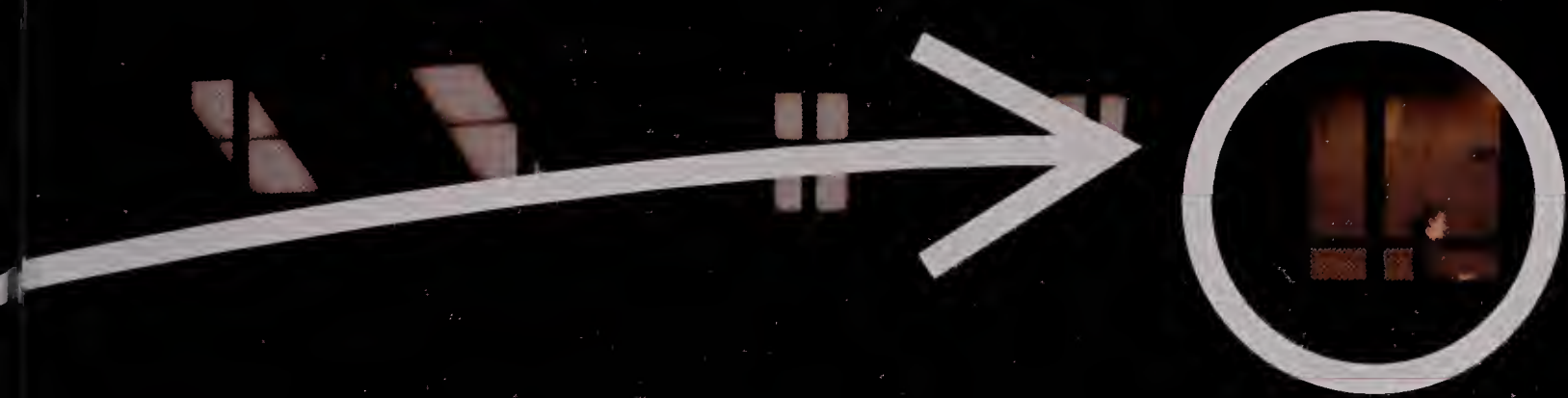
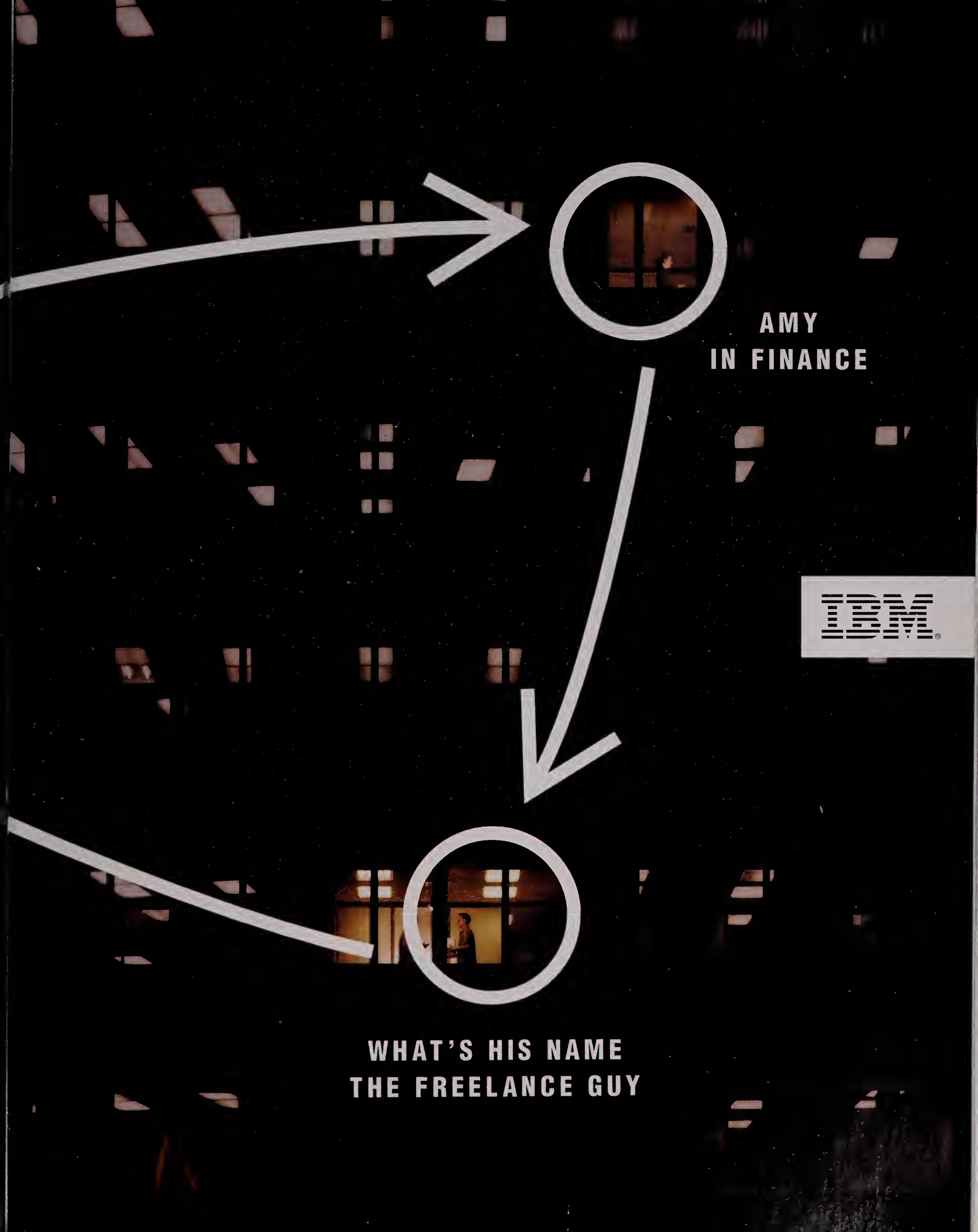


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Stanley "Stash" Jarocki,
chairman of the Financial
Services Information
Sharing and Analysis
Center, says he no longer
has to worry about a "guy
with a gun and a badge"
showing up when he
reports a security breach.

FEAR

A reality check on your top five concerns about reporting security incidents

FACTOR

BY SARAH D. SCALET

Stanley "Stash" Jarocki doesn't act like the agreement he recently signed with the FBI's National Infrastructure Protection Center (NIPC) is a big deal. "It's a prenuptial—nothing exotic," says Jarocki, chairman of the Financial Services Information Sharing and Analysis Center (ISAC) and vice president of information security engineering at Morgan Stanley.

But, in fact, it's a huge deal. With the memorandum

Reader ROI

- ▶ The value proposition for reporting security incidents to law enforcement
- ▶ The myths and realities of the proposed exemption to the Freedom of Information Act
- ▶ How to meet your local FBI agent

of understanding Jarocki signed last June, the ISAC—which was formed in 1999 to give financial companies a place to exchange information about security threats out of the earshot of regulators and law enforcement—has agreed to talk at least once a week to the NIPC, a law

enforcement coordination agency.

So what caused the change of heart? Jarocki says it's because Ron Dick, head of the NIPC, is placing

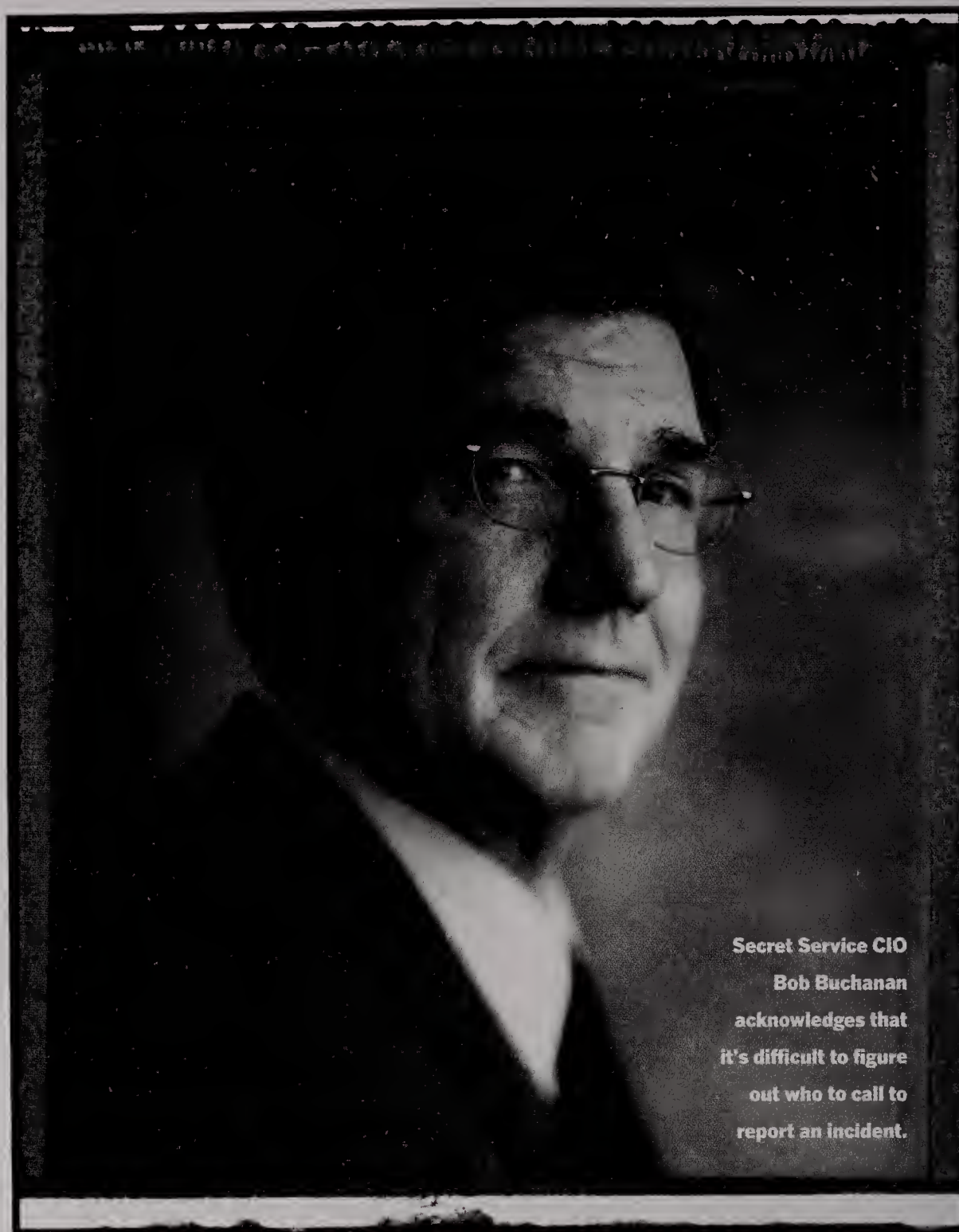
the agency's emphasis on preventing crime rather than on catching perpetrators. "Now if I call Ron's people up and say I've got a problem, I'm not necessarily going to have a guy with a gun and badge here tomorrow," says Jarocki. "He's changed things. I'll get a [computer] analyst before I get a criminal investigator." The NIPC has also offered the ISAC something in return for the information it shares about security threats such as unknown viruses or new kinds of attacks on firewalls: expertise in computer forensics and data analysis.

The agreement is good news for Dick. "When it was first created, the Financial Services ISAC indicated that it would share information amongst its members and *receive* information from the government but found it highly unlikely that they would ever share information *back* to the government," says Dick. "We have been able to demonstrate that we can protect that information, so certain sectors like the financial services sector have seen the value-added associated with two-way information sharing." For instance, last winter the NIPC briefed the ISAC on a newly discovered vulnerability in the common Simple Network Management Protocol (SNMP). Once the vulnerability became public, the ISAC stayed in touch about attacks on SNMP-based hardware and software.

Not that the ISAC members are ready to tell the government all. When members report security incidents to the ISAC, the information is stripped of identifying information, first by a software "scrubber" that erases trademarks, acronyms and other identifying information based on lists provided by members, and then by a human one. Even so, Jarocki says companies are nervous enough about inadvertently revealing weaknesses that they will refuse to share some kinds of information—such as diagrams of network architecture—until they're convinced that that information could not be accessed through a request under the Freedom of Information Act (FOIA). (See "Fact, Fiction and FOIA," Page 65.)

"TO REPORT IT IS TO ADMIT IT"

WHILE THE JUNE AGREEMENT BETWEEN LAW ENFORCEMENT AND THE financial services industry provides the government with what it's wanted for years—a window into the number and types of attacks on the nation's private computer networks—it also shines a light on the anxieties of American industry. Even in financial services, which



is accustomed to filing mandatory "suspicious activity" reports with the Treasury Department about possible money laundering, companies won't easily overcome their fear of reporting computer security incidents, both attempted attacks and actual crimes. "To report it is to admit it," says Sandy Goldstein, CIO and COO of Capsicum Group, the technology subsidiary of law firm Pepper Hamilton in Philadelphia. "To admit it is to say that you're not quite as secure as you want to think you are."

According to the most recent survey by the Computer Security Institute and the San Francisco FBI, only 36 percent of respondents who experienced a computer intrusion reported it to law enforcement. Of those who didn't, 90 percent wanted to avoid negative publicity, and 75 percent feared that competitors would use the information to their advantage.

Executives say they fear backlash from customers, shareholders and even lawyers who might respond to a publicized problem by

withholding their trade, selling their stock or bringing suit. And corporate executives are also not convinced that law enforcement is either capable enough or understands business well enough to help.

CIO set out to do a reality check on those concerns. Fears about incident reporting are the long-ignored monsters under the corporate bed. Some of those monsters can be stared down, and others still need to be tamed. But with national security under intense scrutiny, none of them can be ignored.

FEAR #1 I'LL CALL THE WRONG AGENCY.

EVEN THE CIO OF THE SECRET SERVICE CAN'T PROVIDE A CLEAR answer about where the Secret Service's jurisdiction over computer crime ends and the FBI's begins. "It's spelled out in the U.S. Code, the law of the land, Title 18," says Secret Service CIO Bob Buchanan. "As far as CIOs from private organizations not knowing if they're calling the right person or the right organization, I think there's some truth in that. There are a lot of laws, and it's probably confusing."

Technically, in addition to its presidential duties, the Secret Service is charged with protecting the nation's financial systems. That makes fraud and counterfeiting investigations its domain; the FBI is charged

with handling intrusions, physical threats and website defacement. In reality, jurisdictional issues are complicated enough that at least once a month a group of law enforcement officials comes together under the auspices of the NIPC to "deconflict" their investigations. Maybe the Secret Service is investigating a case in Los Angeles, the FBI has opened a case in Chicago, the Office of Special Investigations is looking into an incident in Florida—and all three trails lead to the same perpetrator. At this monthly meeting, the 22 organizations represented at the NIPC try to figure out whose job is what.

Sound complicated? Try being on the inside. "I don't believe there are any turf wars," Buchanan says. "I think there are some ambiguities that lead to people stepping on each other's toes."

Instead of worrying about the right person to call, officials agree that companies should get to know a local agent from any agency.

In some cities, the FBI's Infragard or the Secret Service's Electronic Crimes Task Force can help. Those groups have meetings where practitioners can meet local law enforcement officials outside of a crisis situation. (To find a local chapter of either group, visit www.infragard.net or www.ectaskforce.org.

Fact, Fiction and FOIA

You might be surprised by what the proposed exemption will do, and even more by what it won't

TO HEAR SOME PRACTITIONERS TELL IT, a new exemption from the Freedom of Information Act (FOIA) is the number-one thing companies want before they'll willingly share information with the government about security threats, vulnerabilities and incidents. But press these practitioners for details and you'll find they're pretty foggy about what the proposed exemption would or would not do. One chief security officer of a Fortune 500 company, who spoke on condition of anonymity, argued for the exemption and then admitted that he really didn't know what FOIA was.

Established in 1966 in Section 552 of Title 5 of the U.S. Code, FOIA was designed to give the public access to the inner workings of government. Journalists, researchers, advocacy groups, businesses and private individuals can file a request with any government agency to access records that might otherwise remain

private. In recent years, FOIA requests have led to the disclosure of files about the assassination of John F. Kennedy and details about Vice President Dick Cheney's energy task force.

FOIA already has several exemptions, but the current debate centers on whether exemption B4—for "trade secrets and commercial or financial information"—protects information about security threats and vulnerabilities as well as it protects, say, the ingredients in Coke's syrup. Many of the government's experts, including Richard Clarke, President Bush's top information security adviser, insist that B4 is protection enough. Nevertheless, they still advocate for an additional exemption, if only to reassure corporate lawyers who don't want to have to rely on case law to protect sensitive data.

In response, the U.S. House of Representatives added an additional FOIA exemption

to last July's bill creating the new Department of Homeland Defense. H.R. 5005 protects voluntarily submitted critical infrastructure information, including the identity of the submitting person or entity, to any covered federal agency. In the Senate's proposed Homeland Defense bill, S. 2452, a narrower version of the exemption would cover only information voluntarily submitted to the new Department of Homeland Defense. Neither exemption says anything about information that's not critical to the infrastructure—like, say, the ingredients in Coke's syrup. But critics fear that the exemption is poorly worded and may be used to hide things like oil spills.

At press time, the Senate was scheduled to debate its Homeland Defense bill. The differences between the bills are likely to be hammered out in a conference committee in one of the rowdiest debates on Capitol Hill this fall.

—S.S.

Information Security

A directory of local law enforcement offices is also included in CIO's "Cyberthreat Response & Reporting Guidelines" at www.cio.com/printlinks.)

"The FBI is a word to most people. You put a face on that," says Chicago Infragard member Willard S. Evans Jr., vice president of information technology services for Peoples Energy. "In this vehicle, you can sit down; you can ask them questions. Now I'm confident I can pick up a phone and talk to someone who is of rank in the FBI about an issue."

REALITY CHECK: Build a relationship with an agent you can trust. Let him worry about jurisdictional issues.

FEAR #2 EVERYONE WILL FIND OUT.

NOBODY WANTS TO SEE HIS COMPANY'S SECURITY PROBLEMS plastered on the front page of *The Wall Street Journal*, so a lot of companies have latched onto a proposed exemption to the FOIA, long championed by Sen. Robert Bennett (R-Utah), as a condition for reporting security incidents. Companies fear that if they share security details with the government, that information could be made

the right thing by calling law enforcement. Christopher Painter, deputy chief of the Computer Crimes and Intellectual Property Section of the Department of Justice, points to one recent case: Bloomberg, the New York City-based news and financial information company, worked with the Justice Department to issue a press release about the arrest of a man who attempted to extort company founder (and current New York City mayor) Michael Bloomberg. "It can be a good moment for the victim, showing that they're taking action," Painter says.

REALITY CHECK: Law enforcement agencies don't make cases public until there's an arrest. It's customers and hackers who make incidents public.

FEAR #3 THEY'LL TAKE AWAY OUR COMPUTERS.

YOU REPORT AN INCIDENT AND AGENTS BARGE INTO YOUR OFFICES, slap yellow tape all over and cart off all your computers.

Of course, no one CIO spoke with actually knows anyone this has happened to, but everyone seems to know someone who knows someone to whom it did.

"I know that's a perception out there, but I can't think of any incident where it's happened," says the NIPC's Dick. "It's our intent to minimize as much as we can the impact on operations."

In the past few years, law enforcement agencies have spent a considerable amount of money training computer forensics experts who can make mirrored images of affected

drives and use backup tapes and logs of network machines.

Also, law enforcement agents seize the perpetrator's computers—not the victim's.

This is not to say you won't lose control in other ways. Doing forensics and gathering evidence takes time. Companies might have trouble getting access to, say, subpoenaed telephone records. But investigators will try not to get in the way of the business doing business. To do otherwise would be bad PR.

REALITY CHECK: The law takes away the perpetrator's computers—not the victim's.

FEAR #4 WE WILL END UP LOOKING BAD.

IN THE MID-'90S, IN PERHAPS THE BIGGEST COMPUTER CRIME ON record, Russian hackers transferred \$10 million from the accounts of Citibank corporate customers into their own pockets. Citibank executives notified the authorities, who worked quietly to identify and arrest then-34-year-old Vladimir Levin and recover all but \$400,000 of the stolen money. "Certainly Citibank had to explain what was going on to the customer base and how they were running security, but no customers left as a result, and as far as I know there was no loss in shareholder value at all," says former Citibank Chief Information Security Officer Stephen Katz.

Only 36 percent of respondents who experienced an intrusion reported it in an FBI survey. Of those who didn't, 90 percent feared bad publicity, and 75 percent feared that competitors would use the information to their advantage.

public through an FOIA request filed by competitors, journalists or watchdog groups. The proposed exemption, passed by the House in July and at press time was awaiting debate in the Senate, would, they think, guarantee that this information remain private.

Some people believe that *any* information shared with a government entity is accessible through an FOIA request and that the proposed exemption would protect everything. In reality, the exemption is intended to protect only information that has to do with the nation's critical infrastructure.

Whether or not the exemption becomes law, an exemption already exists to protect records compiled for law enforcement purposes. Agents are not likely to spill the beans voluntarily, either. Not only would that hurt their ability to prosecute criminals, it would damage their relationships with the companies they were working with.

So how do security incidents become generally known? With denial-of-service attacks or website defacement, the incidents are painfully public. Other times, the person who created the security breach steps forward to boast. Still other times, customers or employees volunteer information to journalists.

Of course, when an arrest is made, it becomes part of the public record. But then the company can celebrate the fact that it did



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So why, going on eight years later, is there still a stigma attached to being the victim of computer crime?

"People are afraid of the unknown," Katz answers. "The only time a company should be concerned about reporting is if they haven't done an effective job putting in security in the first place."

Of course, that's often the case. "Most of this stuff happens because basic things were not done," says Jay Ehrenreich, senior manager in the cybercrime prevention and response group of PricewaterhouseCoopers in New York City.

So what should a company do if it realizes it's made a mistake? Should it fess up? That's a judgment call. But if the news is going to get out (and most significant news does), it may be in the business's best interest to report it and hope for the best. That way, if the news leaks, at least you'll be able to say that you tried to do something right.

REALITY CHECK: There is a stigma attached to victimhood. But getting caught hiding a security problem isn't great for your corporate image either.

FEAR #5 WE WON'T GET ANYTHING OUT OF IT.

RUSS LEWIS, CIO AND EXECUTIVE VICE PRESIDENT OF GFI, ASKS himself whether reporting a security incident will be a plus for his company.

"If we called law enforcement, it might be more time-consuming than the fix would be," says Lewis, whose New York City-based company provides software and other services to Fortune 50 companies dealing in exotic derivatives. "If somebody hacks into my corporate websites and changes words on a page, I'm not necessarily overly fussed. [But] we'd notify law enforcement if [hackers] were able to go in and modify our trading data or if they caused a financial hardship to the firm. If a trail led anyplace, we might get [law enforcement] involved—if there's a value to me."

That value is exactly what law enforcement wants business to see. Unfortunately, there are no numbers to prove it.

Bob Weaver, deputy special agent in charge of the Secret Service's New York Electronic Crimes Task Force, thinks his agency's value proposition for business can best be demonstrated by changing the traditional, reactive approach of law enforcement to a preventative model, similar to the one his agency uses to protect the president. "Is it a good idea for the United States to have a lot of dead presidents?" he asks rhetorically.

Weaver's task force, which has made more than 1,000 arrests since 1995, has a good record—so good that it was named a model for the nation in the USA Patriot Act, the broad antiterrorism legislation passed by Congress shortly after Sept. 11. But

CIO.COM For the **LATEST NEWS ON THE CONGRESSIONAL DEBATE** on the Freedom of Information Act exemption, go to the online version of this story or to www.cio.com/printlinks.

what Weaver is most proud of is the quarterly meetings of the task force where practitioners and agents from many branches of law enforcement get to know each other and share best practices.

"You have to break down the cultural barriers between law enforcement and the private sector," Weaver says. With the task force, agents are taught about business, and businesses get to know agents. "I understand your value set, you understand mine, and information flows both ways and not a crime has ever been committed. Now we're cookin'," he says.

REALITY CHECK: Law enforcement must demonstrate that sharing information can help prevent future incidents. Until it does so, the value proposition may not add up.

NEW MONSTERS?

RIGHT NOW, YOU CAN DO YOUR OWN COST-BENEFIT ANALYSIS about whether the risk of reporting a security incident is worth the potential return. But that may not be the case for long. Sen. Bennett, who introduced the FOIA exemption proposal, has long said that companies should be required to disclose to the Securities and Exchange Commission their readiness to deal with computer attacks, much as they were forced to disclose their Y2K readiness. And at a heated House committee debate

R

ight now, you can do your own cost-benefit analysis about whether the risk of reporting a security incident is worth the potential return. But that may not be the case for long.

over the proposed FOIA exemption last July, Rep. Janice Schakowsky (D-Ill.), after calling the exemption "a loophole big enough to drive any corporation and its secrets through," fired a warning shot: "I just want to suggest there's another option. And that is to say this information isn't voluntary, that we require it."

Or maybe it already is. "We can show that reporting may be a legal duty," says Christopher Wolf, a partner for Proskauer Rose in Washington, D.C.—specifically, in cases where an incident could have a significant impact on business.

And this might be the real monster under the bed. If you choose not to report security incidents, someone may end up choosing for you. **CIO**

Senior Writer Sarah D. Scalet writes on security issues for *CIO* and *CSO* magazines. She can be reached at sscalet@cio.com.

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SURPRISINGLY, MOST AGAINST LIFE'S UNPRE

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According to leading industry analysts, over 15% of laptops are lost, stolen or suffer hardware failure each year. With up to 40GB hard drives common these days, that's a lot of data at risk. Yet most companies still only think of backing up their servers. Which leaves all that data on all those PCs vulnerable. (And don't even get us started on the perils from hackers, viruses, losses, and user errors.)

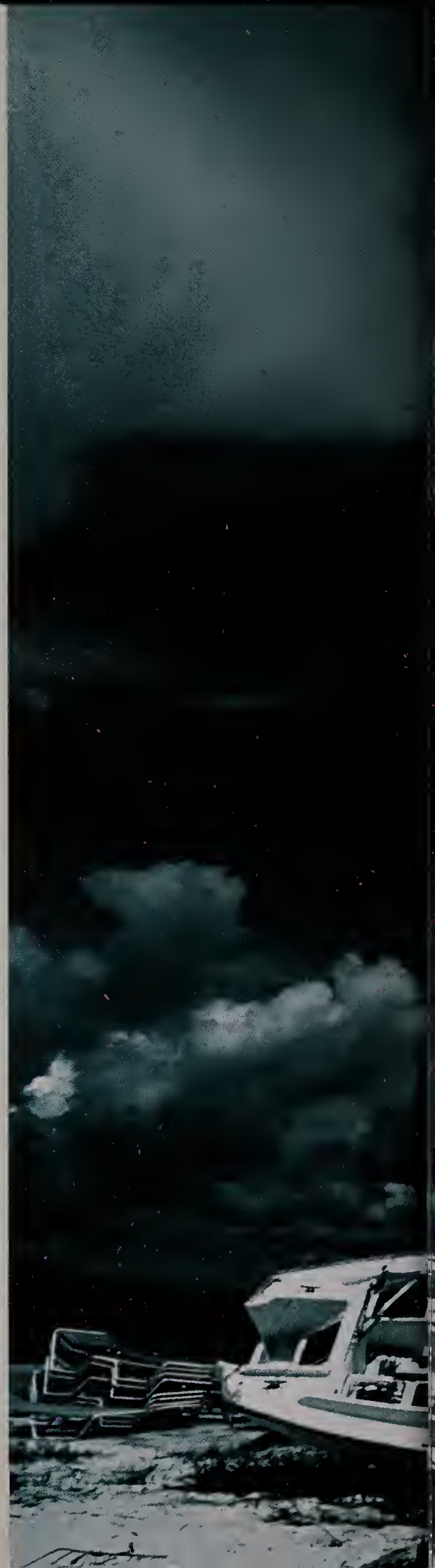
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**CIOS HAVE PROTECTION
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Roy Dunbar, CIO of Eli Lilly, had to sit the scientists and the technologists down at the same table to foster true collaboration.

In the race to develop new pharmaceuticals more quickly, companies are introducing new IT tools. But the tools can't do it alone. CIOs need to change the way people do their work.

THEY WANT A NEW DRUG

BY STEPHANIE OVERBY

As vice president of worldwide informatics for Pfizer Global R&D, Walter Hauck had been diligent about getting just the right people on his team. He had been charged with integrating the disjointed R&D efforts at the biggest pharmaceutical company in the world. He was supposed to create the tools and processes that would allow scientists and clinicians and marketers and lawyers to work together to introduce Pfizer's next generation of drugs.

So Hauck hunted for people who knew both IT and science and asked them to join his 1,200-person team. He assigned them to research sites around the globe so that they could learn Pfizer's business and guide their users through the transformation. He recruited people from the research and development side to join the informatics department.

But Hauck found out that PhDs and dual degrees weren't enough because most of the people working for him didn't know diddly about change management. And Hauck didn't know enough either.

That became clear during the integration of the R&D division of Warner-Lambert, the Morris Plains, N.J.-based drug company Pfizer acquired in 2000. Hauck figured that the simplest, most logical way to handle the changes was to do them all at once. His IT team agreed. At La Jolla Labs in California, for instance, Hauck's team introduced one new application a week for six months.

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- ▶ How three companies struggled to change their cultures
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- ▶ New tricks for knitting your back-end systems with customer-facing technologies

Soon, the scientists and lab workers were ready to riot.

"They were saying, We're trying to deliver new compounds and develop new drugs, and we have to spend all our time learning these new systems," recalls Hauck, who heard similar reactions throughout the newly merged organization. "It was a lot of change to drop on people while expecting them to continue to deliver." After all, these new technologies were supposed to improve productivity, not impede it.

That's when Hauck decided to educate himself and his staff about managing change. "In the end," he says, "integration comes down to nothing more than change management."

technology," says Roy Dunbar, vice president of IT and CIO at Eli Lilly. "That requires getting scientists to work in different ways. And that's a huge shift in culture."

The challenge facing the pharmaceutical industry is fairly straightforward. For years, biologists, chemists and clinicians worked in relative isolation. Integration didn't occur among humans, let alone on a systems level. "It's a pretty frustrating situation for a CIO," explains Charles-Andre Brouwers, a vice president of the Boston Consulting Group who is based in New York City. "There's so much focus on a specific project, a specific compound, a specific target. Each person is intensely focused on his own part of the value chain."

need for an IT infrastructure that pulls back-end systems together with marketing and customer-facing technologies. And whether the industry makes cars or drugs, the CIO is the executive in charge of the change management that must take place before this vast infrastructure can do its job.

At Lilly, Dunbar has had to struggle to meld the warring mind-sets of IT and science. For Pfizer's Hauck, it has meant retraining his staff. And at Aventis, it has meant that users who dare to be innovative in their use of IT and are willing to participate in pilots are not only protected politically but recognized globally.

"R&D is useless unless it can be integrated into a bigger picture that helps you

Legacy behaviors are as bad or worse than legacy systems. Systems are dumb and can be easily replaced. People are sentimental; they have reasons why they do what they do. And they can't be so easily replaced." —Roy Dunbar, CIO at Eli Lilly

Divided They Fail

Throughout the \$418 billion pharmaceutical industry, money-making drugs such as Eli Lilly's Prozac, Aventis's Allegra and Pfizer's Zoloft are going off patent, meaning the huge profits they've been generating will diminish. At the same time, masses of new data are piling up from the decoding of the human genome. In order to make sense of all this information and reduce the time and money it takes to bring drugs to market, pharmaceutical companies are introducing new technologies ranging from the automated screening of potential compounds by the thousands to software that speeds the process of synthesizing and then testing the most promising chemical compounds. But exploiting the full potential of these new tools requires a fundamental shift in the way Big Pharma R&D works.

"The technology itself is tricky. But once you put the technology in place, there's the entirely different matter of getting people comfortable with and confident in using the

Meanwhile, mega-mergers have created gargantuan global drug conglomerates and even more disjointed R&D cultures, "aggravating the problem at a time when shortening research cycles has become ever more a priority," says Michael Barrett, senior analyst at Cambridge, Mass.-based Forrester Research.

As Big Pharma makes the big move from a bench-based environment of beakers and Bunsen burners and scientists working in isolation to a collaborative environment of digitized data and automated processes, the CIO finds himself at the hot center of change. And the ability to manage that change coolly will be the critical factor in his success—or lack thereof.

"Legacy behaviors are as bad or worse than legacy systems," says Dunbar. "Systems are dumb and can be easily replaced. People are sentimental; they have reasons why they do what they do. And they can't be so easily replaced."

Other industries are confronting the same

convert leads to drug candidates," says Charles Cooney, codirector of the Program on the Pharmaceutical Industry at MIT in Cambridge, Mass. "The difficulty for the CIO is getting the team to work between the various disciplines needed to integrate the information in order to create knowledge."

AT ELI LILLY

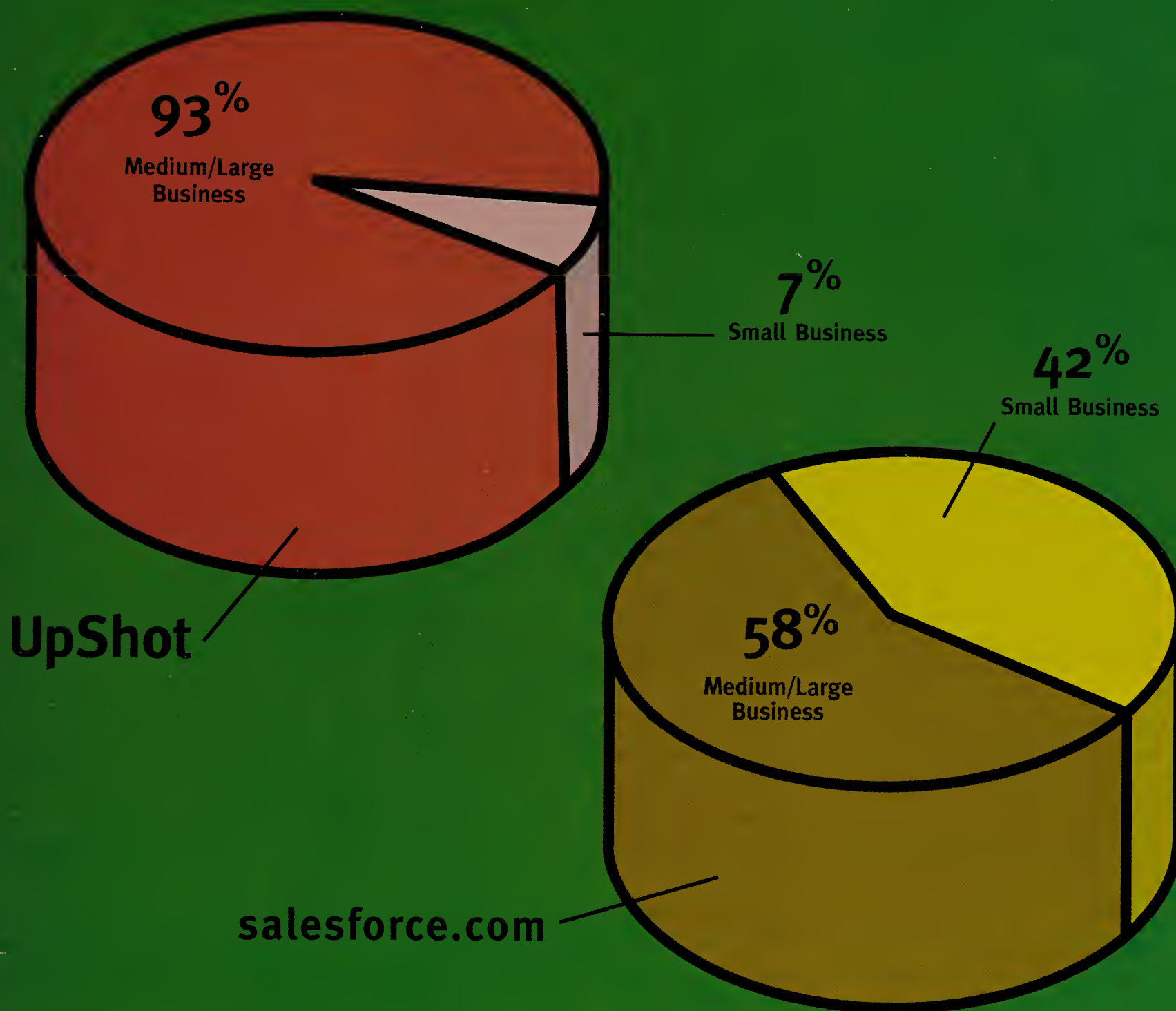
The Sound of Two Hands Clapping

When Dunbar took over as CIO at Eli Lilly in 1999, the Indianapolis-based drugmaker was in the doldrums. Lilly's leading moneymaker at the time, Prozac, was set to go off patent in 2001, bringing a major erosion in revenue right around the corner. The \$12.5 billion company had been increasing its investment in R&D (up to \$2.2 billion that year), but the money wasn't boosting productivity.

Dunbar, who had previously worked in marketing and product development at the 126-year-old company, knew that simply pumping more money into R&D would not

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Customer Mix— Customer Relationship Management Magazine, May 2002 (Source: Summit Strategies).



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fill Lilly's pipeline. For more than a century, Lilly's divisions had operated virtually autonomously. But now Lilly wanted to connect the dots of the R&D work being done at dozens of the company's sites by 8,000 employees throughout the world.

"The goal is to have information flowing from tool to tool so you have a kind of wall-to-wall carpeting of technologies along the value chain," says Dunbar. "That will give us a huge amount of productivity."

During the past three years, Dunbar and his team have introduced a host of new technologies. They include a searchable database of molecular information that allows researchers to locate all relevant experiments in a specific area, a bioinformatics application called Game (Gene Anatomy Made Easy) that enables researchers to perform genomic searches in minutes, and a tool from Internet Database Solutions called ActivityBase that cuts the time it takes to analyze compounds from five hours to 30 minutes. Dunbar has made those and other applications available through the \$4 million Elvis (Eli Lilly Virtual Information System) portal launched last year. Dunbar's team is also working to integrate the data in the disparate applications.

The master plan is to extend the integration to all parts of the business. "We have a new area called pharmacogenomics that looks at how my DNA may result in me responding differently to a drug than another person," Dunbar explains. "In the

future, our marketing people are going to be interested in understanding what subsets of the population are going to respond best to a particular product so they can market it directly to them."

Dunbar says the ultimate success of those tools will depend on what he calls the two-handed clap—the collaboration between IT and scientific business partners.

"It's one thing if you have a fantastic IT organization but you have a constituency uninterested in using IT," he says. "It's another thing if the users are demanding real IT solutions and the IT department is not up to the task. What we have is the coming together of a capable IT team and a scientific team that sees IT as a partner. One without the other would be as futile as a one-handed clap."

That kind of collaboration wasn't happening when Dunbar joined the IT team three years ago.

"Traditional IT thinking is based on the engineering mind-set: You describe a process, break it down, build one solution and use it thousands of times," Dunbar explains. "The scientific mind-set is more experimental: You discover a problem, ask a question, conduct an experiment, and once you get an answer, you move on to a new question."

In order to work on successful IT solutions, the two groups had to adjust to each other's native thought processes. "The IT group needed to start thinking about building a small set of systems that allow for

CIO.com For more on change management, read how FedEx does it in **NEXT DAY CHANGE GUARANTEED** (www.cio.com/printlinks), and check out the Leadership and Management Research Center at www.cio.com/leadership.

some experimentation," says Dunbar. "The scientific folks needed to get a sense of a more structured approach to doing their work that could be modeled in IT."

To facilitate such a meeting of mind-sets, Dunbar doubled his department to 2,700 (600 of them devoted to R&D), and he has increasingly hired people with dual computer science and biology or chemistry degrees. Such interdisciplinary fluency enables Dunbar's staff to talk to scientists about the value of trying out new systems.

At Lilly, "scientists and technologists literally sit together in a room and engage in conversations about the future," says Dunbar. They first convene to discuss resources and prioritize a portfolio of projects each quarter. Then a small group of scientists chosen to champion a project acts as liaisons between the IT project leader and team of programmers and the scientists. They discuss requirements, and the programmers develop a prototype. Then the real talking starts, as the two sides figure out what has to happen for the new technology to work. Does an application need to change? Does a business process need to be tweaked?

"It's never just a question of putting the technology in place," says Dunbar.

The discussions seem to be working. Scientists are actually asking to be trained on new systems, like ActivityBase, now being rolled out to thousands of researchers on three continents. "They're hearing about tenfold cycle time reductions on getting information, and the demand for training and process change is increasing. It's a good sign," Dunbar says.

No more than two weeks go by without a meeting between IT and R&D. "Even as the projects move into production, it's senior-level scientists who are championing the new tools and evangelizing about their benefits,"

5 Change Management Tips for IT

- 1 Physically align with your users.** If your IT employees work beside the end users, they'll learn as much about the business as they know about IT.
- 2 Keep your users in the loop.** User representatives should remain invested and involved from the first discussions of a new system through production and implementation to postmortem.
- 3 Know thyself.** You think like an engineer. Stop it. Try to think like your business partner as you work out new systems and business processes together.
- 4 Define change management best practices.** Give your IT team the tools to manage change, or minor mistakes will become major problems.
- 5 Protect innovators and publicize their successes.** Users willing to take the time and assume the risk of testing out new systems should be rewarded, never punished. —S.O.

Dunbar explains. "From the vice president level down, they're leading the change."

AT PFIZER

Teach Your Techies Well

It's hard to imagine that Pfizer—the number-one U.S. drugmaker with seven blockbuster drugs currently seeing annual sales of more than \$1 billion each and 130 new drug candidates in the pipeline—would be under pressure to streamline development. But it is.

"We have to deliver the next wave of compounds—15 in five years—and those will come only through integration," insists Hauck. Money certainly is not the issue. Pfizer Global's R&D budget in 2002 was \$4.7 billion (the highest in the pharmaceutical industry and the third highest, it says, of any company in any industry worldwide). "We need to double our R&D productivity, and that's not going to happen by making researchers work 80 hours a week."

Like Dunbar, Hauck has found that forging ties between IT and the New York City-based company's 20 research sites is critical to the integration effort's success. His 1,200 full-time IT employees and 800 contractors are organized into development teams working elbow to elbow with 12,000 scientists trying to discover the next Viagra or Zoloft. "It's important to me to have people at each site, affiliated with single users and spending years to learn their business processes," says Hauck.

"I'm a software professional by training, but I need to know the business cold," he adds. Since he became vice president of worldwide informatics in 1995, he has been working to move R&D applications to the Web so that everyone at the company can access them.

But two years ago, the ante was upped with the acquisition of Warner-Lambert. The merger made Pfizer the fifth largest company in the world. It also presented a huge integration challenge.

"In the end," Hauck recalls, "we changed pretty much everything at once. And the sheer volume of change was a lot to digest."

In the process, Hauck found that his employees would "trip over simple things,"



Peter Loupos, vice president of DI&A information solutions at Aventis, found that rewarding innovation got other scientists to think outside the box.

like forgetting to coordinate training so that users wouldn't have to sit through the same presentation several times. Or they wouldn't wait to see how well a new application was being adopted before introducing the next one.

"What I've decided to try to do," he says, "is to stop making it an experiential thing in which we have to relearn the same lessons, and instead begin to codify change management practices and teach them to the staff."

To that end, Hauck created a standard change management strategy and checklist for every informatics project. Did the project leaders assess business readiness for change? Did they adequately resource the first pilot? Did they check for feedback?

"What's most important," says Hauck, "is to teach my staff what it takes to make change a reality."

AT AVENTIS

Encourage Innovation

At Strasbourg, France-based Aventis Pharmaceuticals, the name of its R&D opera-

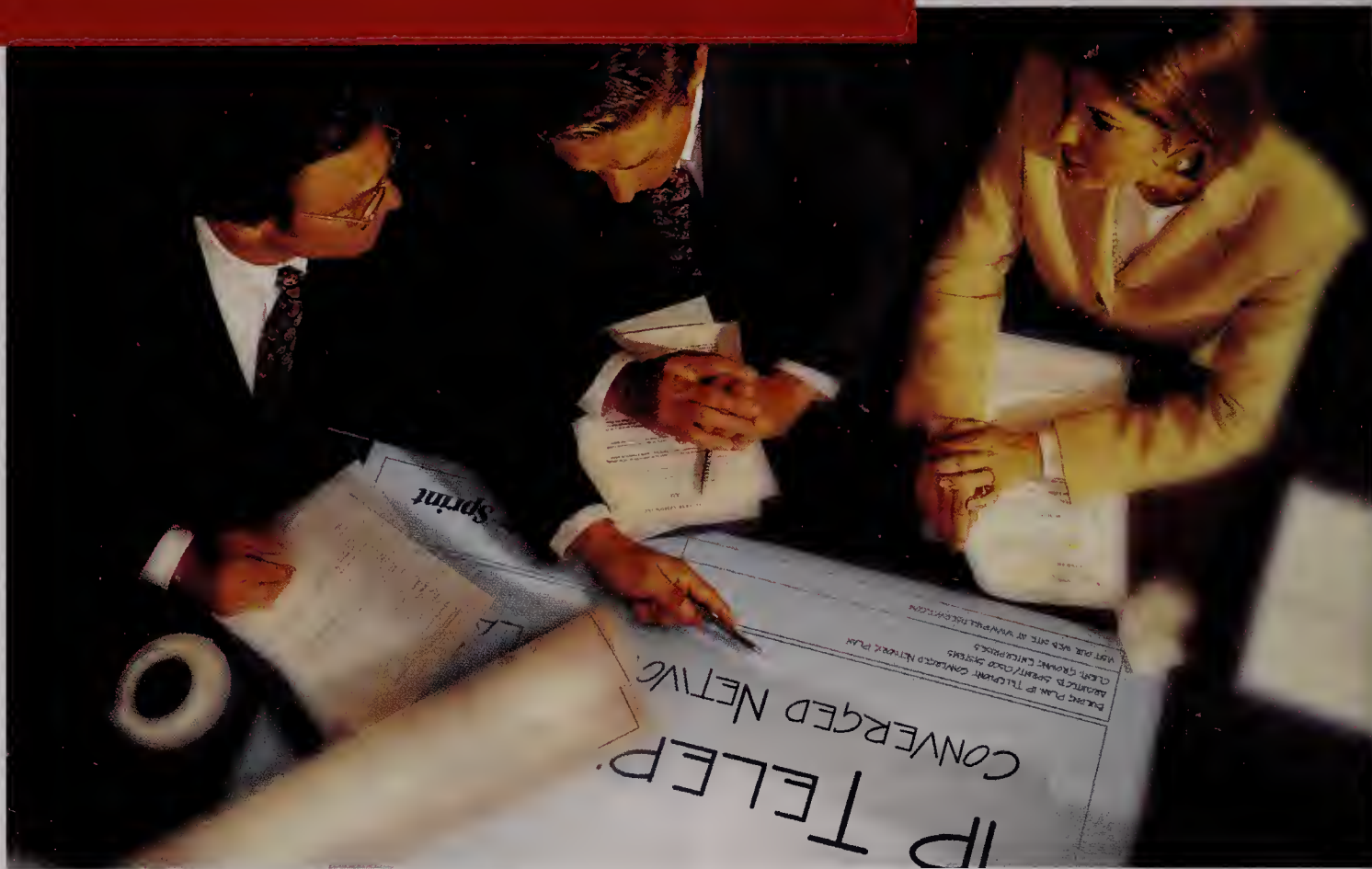
tion—Drug Innovation and Approval (DI&A)—certainly suggests an environment that embraces change. But as Peter Loupos, vice president of DI&A information solutions, discovered, introducing new collaborative systems to the division's 5,000 scientists and support staff in the United States, Germany, France and Japan—and actually getting them to use the systems—required more than just a cool name.

As was the case at every other drug company, Aventis (formed by the merger of Rhone-Poulenc Rorer and Hoechst Marion Roussel in 1999) researchers focused on their own tiny piece of the puzzle. "Chemists just worked with chemists," says Loupos. "Biologists just worked with biologists."

But today, with the goal of introducing two to three new drugs a year, DI&A is devoting itself to chemical biology, an approach that, as its name suggests, involves bringing together once separate disciplines.

For Loupos and his team of 250 IT staffers, that has meant creating Web-ready databases, visualization tools that combine

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Change Management

information on chemical structure and biology, portal technology to enable researchers to access common data, and collaboration software so that far-flung individuals can work as a team. This integrated IT platform allows an expert on ion channels in Bridgewater, N.J., to contribute to a Parkinson's disease project in Paris.

But getting that ion channel expert to explore this new way of working can take some coaxing.

"You need to signal that risk-takers will be rewarded rather than penalized," says Forrester's Barrett. "If the leader of a team

tive word of mouth outside the pilot group, it gave Loupos something he could take to Chief Scientific Officer Frank Douglas, who approved a full-scale rollout of the system. "We're using technology to push a real cultural shift here," says Loupos. "We're getting to the point where people get excited when they discover something new using IS and they want to share it with their colleagues."

Loupos admits that the attitude change at Aventis hasn't occurred overnight. "Obviously, we had our early adopters and others that have seen what's happen-

"We're getting to the point where people get excited when they discover something new using IS." —Peter Loupos of Aventis's DI&A division

volunteers to use a new technology, he should be protected from the downside that always attends innovation. A researcher trying to get a certain therapy to market in four years isn't going to want to risk a six-month delay. The remedy for that is political support." What that means is that executives and department heads must let it be known that project delays due to technology innovation will not reflect poorly on participants.

The other part of Loupos's effort involves publicizing success. For example, last year Loupos was conducting a pilot of a Web-based knowledge management tool called KnowledgeMail. At the same time, a scientist researching degenerative thrombotic and joint diseases in Frankfurt, Germany, was beginning a project to isolate and culture large white blood cells that ingest and destroy microbes and other foreign substances. Using KnowledgeMail, he discovered two scientists in Bridgewater who could help him out. One provided culturing protocols, the other offered information on magnetic cell sorting. The result: four weeks shaved off his project.

Not only did his success generate posi-

ing and eventually came on board," he says. "And there are some others who may never jump on the wagon.

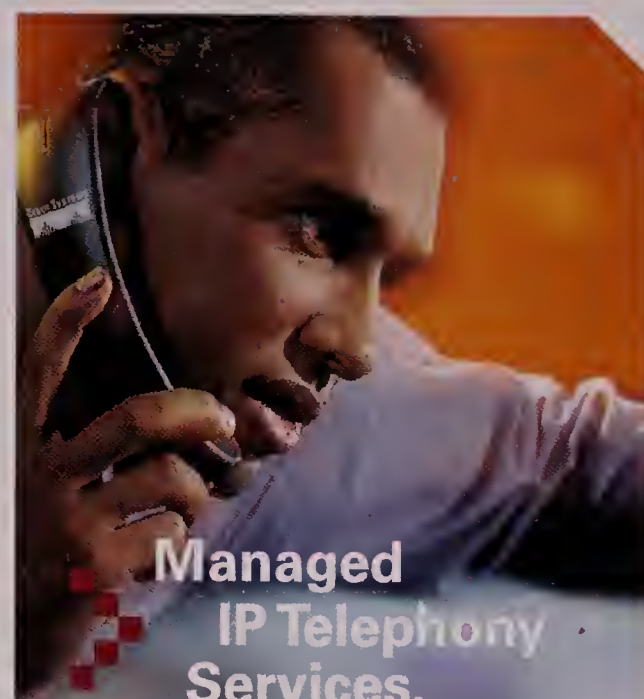
"I think it's more important to spend time with the innovators," he adds, "which is where you're going to get the biggest benefit."

CIOs will need to get the word out about what the innovators are working on, Barrett says. "One of the real problems is that genuine innovation with a given group isn't communicated through the rest of the organization," he explains. "The CIO has a key role as facilitator. He or she stands at a crossroads of information. He can showcase successful IT applications companywide.

"There are very few genuine innovators, but there are massive numbers of fast followers," Barrett adds.

And that's the way change happens. Leaders experience success, and everyone else wants to share in it. **CIO**

Senior Writer Stephanie Overby writes frequently about health care and related industries. You can share your thoughts on change management with her at soverby@cio.com.



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It's the dawning of the petabyte age. And with it comes new capabilities for the enterprise, new responsibilities for CIOs and, of course, lots of new problems.

BY FRED HAPGOOD

BIG
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Reader ROI

- ▶ How the ability to store petabytes of information can transform CRM
- ▶ Why some believe it's impossible to ever search a petabyte accurately
- ▶ The products that can help CIOs manage petabytes

GEER



Suppose you came to work one day, took off your jacket, loosened your tie, sat down and found a letter on your desk from corporate counsel advising you that a court has just ruled that corporations are now responsible for retaining all business-related phone conversations for one calendar year.

Under this letter is a memo from the PR department (labeled URGENT) advising you that marketing's plan to use face recognition technology to

identify prime customers entering the store may be getting some negative reviews in the press, with phrases like *invasion of privacy* and *Big Brother* being tossed around.

And under that is a directive from management asking for a technical analysis of a market simulator that may be able to predict to 5 percent accuracy the response to a new product of single parents between the ages of 29 and 33 living in Illinois suburbs with

Data Trends

incomes in the third decile.

Who are you? You're a petabyte CIO, the person responsible for developing and maintaining the science-fiction-like applications that will be running on tomorrow's immense storage capacities. Currently, petabyte responsibilities are mostly restricted to the IT departments of universities, research organizations, and microbiology and genetics labs. But the law of technological adoption ("If you build it, they will use it") says that sooner or later most CIOs will be crossing that line, discovering a new world of applications, responsibilities, costs and problems. So it's time to start thinking about...

PETABYTE POWER

Petabyte levels of storage will make possible three new categories of applications. One group depends on retaining and processing vast amounts of visual data, especially data from video cams. Imagine cameras trained on the sales floor, recording the minute-by-minute flow of customer traffic. Imagine that data feeding an application that analyzes the relative effectiveness of a given product placement or the impact of a markdown. Marketing might be interested in learning how the proportion of couples to singles entering the store changes during the course of a two-week promotional campaign, or at what time of day the number of women shopping with kids rises and at what time it falls. With petabyte levels of storage, HR will be able to crunch a few months' worth of video camera data to flag personnel responsible for traffic bottlenecks on the sales floor.

A second category of petabyte potential is in supporting the transition to device networks. If the first generation of networks connected people to data and to each other, the second will do the same with both physical (counters, meters, cameras, motors, switches, telephones, digital printers) and virtual devices (applications and program objects). The great virtue of device networks is that they allow any interested constituency to have remote access to any link in the production cycle. CNN, for example, is digitizing and net-

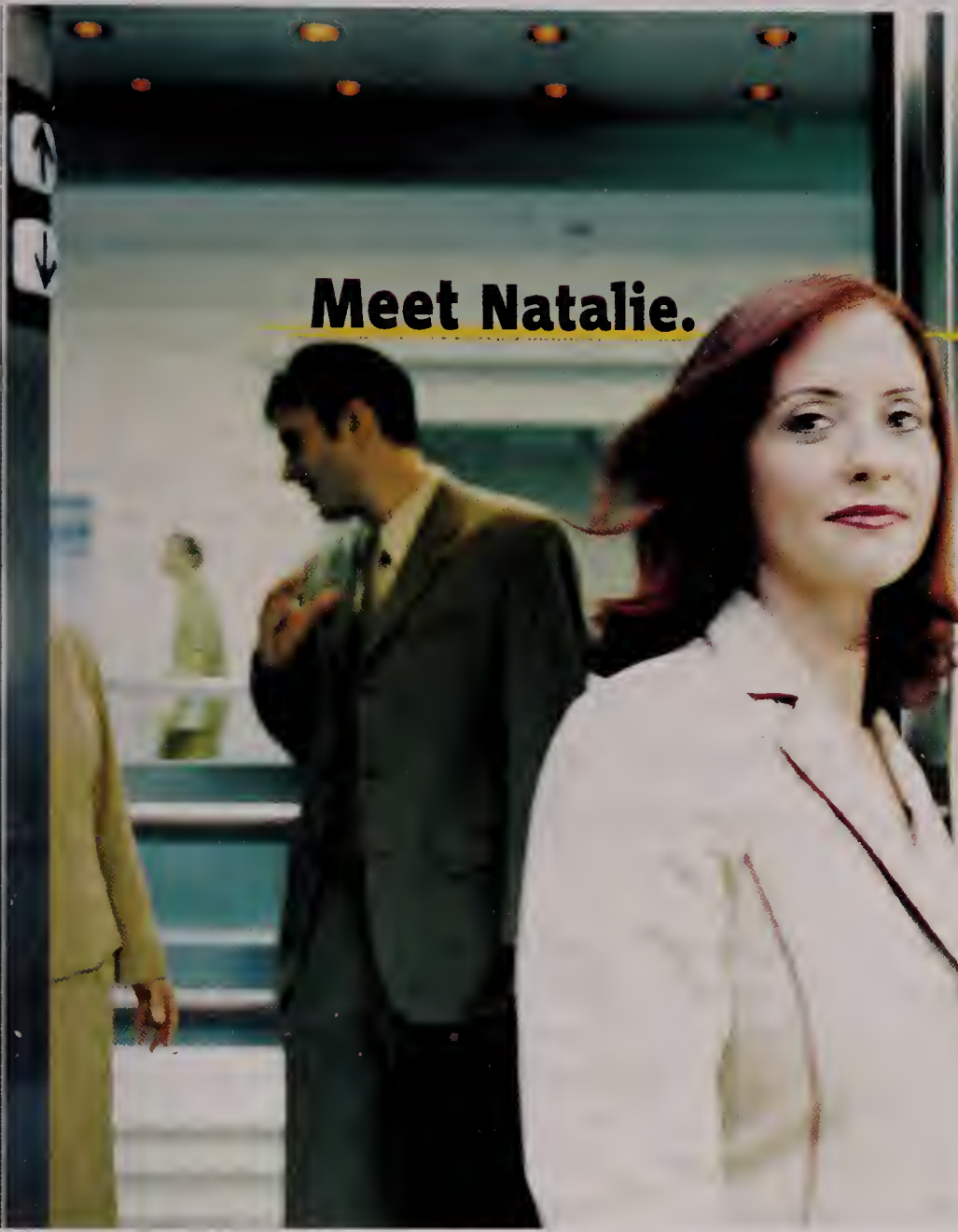


A terabyte is 12 zeros. You need that to express the number of square inches (4,872,996,000,000) in Rhode Island. **A petabyte** is 15 zeros. You need that to do the same for Mexico (3,057,065,000,000,000).

working all its production equipment so that pagers, cell phones, PDAs, desktops and web-sites will all have equal, continuous and simultaneous access to programming.

In many industries, machines already keep maintenance informed about their operating condition, allowing them to be repaired just before they are about to fail. But if all the

machines in a production line could be fully networked, management would be able to switch an entire production process to a single desired configuration—change the car's bench seats, for example, to buckets, or its color from bottle-green to battleship gray—from half a world away. Once manufacturers can do that reliably, the dream of on-demand



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However, properly managing the thousands of sensor-actuated loops that form device networks requires retaining the history of their states, often in their raw, unsummarized form, for months and possibly years. To do that, you need to be able to store data in petabytes.

Finally, petabyte levels of storage would allow simulations and predictive models of enormous complexity. For instance, retail managers currently worry about how they can persuade a casual visitor to make a purchase. While this is an important problem,

The reason it's discarded is because heretofore it was impossible to store. Petabyte levels of storage will change that.

PETABYTE PROBLEMS

It's easy to think of reasons why management might want to ask the CIO to lead the enterprise through the petabyte door. The next issue is finding ways to do that without getting fired.

If you assume storage-related costs (especially the time penalties) scale linearly, then the headaches that come along with petabyte management will dwarf the headaches asso-

on trying to extract more intelligence from current data stores rather than piling up haystacks with fewer and fewer needles hidden in them.

PETABYTE SOLUTIONS

Other observers are betting that new technologies will be able to keep those penalties under control. Like many IT problems, the solutions being explored fall along the spectrum of centralized to distributed.

Ron Davis, senior IT architect of Equifax, the Atlanta-based consumer data company, is working with a centralized management

Searches conducted on large volumes of data naturally generate more errors. At some point, the number of errors so overwhelm the user's ability to cope that the system essentially becomes useless.

even more critical is how to turn a casual buyer into a loyal, recurring one. Over the long term, this second kind of conversion can deliver even more value to the enterprise.

But brand loyalty doesn't happen overnight, points out Richard Winter, president of the Winter Corp., a Waltham, Mass.-based consultancy specializing in the architecture of very large databases. "[Transforming] someone into a repeat customer means presenting her with just the right information or opportunity at the right time," he says. "Knowing what to present can mean retaining huge amounts of information on that customer—what they've looked at, checked prices on, asked about, what they've *not* looked at—over long periods. Often the relationship needs to be followed from the point the customer first appears. Right now, that's impossible because raw, unsummarized, clickstream and transaction data is generally discarded after 30 to 60 days."

ciated with a terabyte of data as an eight-story building towers over an inch-high matchbox.

Does that make you cringe? Wait. It gets worse.

Searches conducted on large volumes of data naturally generate more errors. At some point, the number of errors so overwhelm the user's ability to cope that the system essentially becomes useless. The only solution is to rewrite the search programs so that they make fewer errors, and no IT development task is harder to do predictably than boosting the IQ of computer programs. Finally, according to John Parkinson, CTO of Cap Gemini Ernst & Young for the America's region, even the cost of the core overhead tasks (such as buffer management) typically grow faster than linearly.

One school of thought is that transition to petabyte levels is just not worth it.

Faisal Shah, cofounder and CTO of Chicago-based systems integrator Knightsbridge Solutions, says that data quality naturally drifts down as more space opens up in the corporate attic, in part because you are now saving things you used to throw away. Shah believes that companies will be better off spending their now-restricted IT dollars

solution from Corworks. Equifax's business is to buy raw data from state agencies or directory companies, and turn it into information products. Equifax wants to control the data it buys for as long as possible as it never knows what a new product design might call for or when. While the data could, in theory, be left with its suppliers, Davis's experience is that retention policies and practices vary too widely over Equifax's 14,000 data sources to make such dependence practical. He believes that at least over the short run, companies near the end of the value chain will have to take on the responsibility of archiving raw data. Shouldering this responsibility has put Equifax on the road to becoming a petabyte company, and it has forced Davis to search for an architecture competent to deal with the petabyte problems of cost, error and time.

Corworks' basic idea is to beat the time penalties inherent in handling large volumes of data by loading it into electronic memory. This seems counterintuitive, rather like making a quart easier to drink by squeezing it into a pint, but the feat is done by stripping out the structural data (such as converting everything into flat files), com-

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pressing the result, and then relying on fast processors to decompress and restore the data structures only as needed. In other words, just-in-time logic.

"I have a 67 billion row table," Davis says, "and I can do a sort across six months of that table in three seconds." Backing up and restoring became easier for the same reasons.

A second approach to leveraging the speed of electronic memory is to build algorithms that can grade data by importance. The most critical pieces get loaded into memory, while the rest goes to disk-based systems where lower performance levels (and therefore lower operating costs) are tolerable. Dave Harley, chief designer of London-based BT Group, is experimenting with this approach with software from Princeton Softtech. While the application has been used only in the system that supports IT management for its employees in asset management and fault tracking, results have been such that Harley expects to see this so-called active archiving adopted throughout the company. "The key factor is keeping the most critical database as small as possible," he says. "It's quite a new idea."

StorageNetworks of Waltham, Mass., is also using this approach to manage the 1.5 petabytes acquired through its storage services arm. CEO Peter Bell says that 70 percent of the data stored on an average system has not been looked at in the previous 90 days. If you make the reasonable assumption that the number of recent accesses is a dependable way to determine relative enterprise criticality, then loading just the most used data into memory can go a long way to delivering acceptable performance where it is needed. Bell adds that the critical issue in managing petabyte-scale volumes of data is developing data classification systems that balance power without introducing excessive single point-of-failure risks. (If a computer managing a petabyte goes bad, the damage it can cause is breathtaking.)

On the other hand, Len Cavers, director of technical development for Experian, an Equifax competitor, believes that in the long run centralized solutions will not scale adequately. He argues that as backbone bandwidth speeds increase and data standards get defined and distributed, companies such as his will find it increasingly practical to "leave the data" higher and higher up the value chain. In that world, the networks would carry not raw data (which wouldn't move) but queries and intelligent indexes so that querying systems know which to connect to. Experian is now involved with an active

even more sweeping than those associated with previous leaps in storage. "Traditionally vendors have built standalone data mining engines and moved the data into them," says Winter. "But are you going to be able to move a petabyte around like that?" Winter foresees radical changes in engine architecture, probably involving breakthroughs in the engineering of parallelization.

"The whole notion of storage takes on a new meaning," says Scot Klimke, vice president and CIO for Network Appliance, a storage services vendor in Sunnyvale, Calif. "It starts to be defined less as simple reten-

As the petabyte revolution picks up steam, the **struggle** to measure and manage data quality will increasingly define the **CIO's job**.

development program with its partners over how to use XML and Web services to frame and respond to queries and generate indexes.

Cavers believes that petabyte-level data stores will force IT people to minimize the number of mass copy operations as much as possible. "This is a paradigm shift in the way people think about computing," he says.

THE PETABYTE PARADIGM

Gerry Higgins, senior vice president of Verizon information processing services in New York City, points out that maintaining a petabyte of data raises distribution management issues in hardware as well as software. In the petabyte world, data is usually spread over thousands of disks. "Vendors always want to talk to me about how great their mean-time-between-failure numbers are. I tell them not to bother. All I'm interested in is what happens when there is a failure," Higgins says. "When you deal with so many disks, some are always crashing. I tell them that when you're a petabyte guy like me, you have to expect failures."

Many observers think the transition to petabyte levels is going to introduce changes

tion and more as the struggle for information quality."

Perhaps the worst such issue is consistency. A petabyte of data is so big, and the quality of the information it contains is perforce so low, that it is bound to contain and create inconsistent information, which means that any petabyte-level system has to contain ways of detecting and resolving data conflicts.

Another issue is aging: Information quality varies, roughly, with age, but present systems are poorly equipped to track the age of material, especially material within a file. "I have five priorities for this fiscal year," Klimke says. "Two involve data quality."

Klimke argues that as the petabyte revolution picks up steam, the struggle to measure and manage data quality will increasingly define the CIO's job. While he might or might not be right about this specific point, it's clear that anyone exploring the petabyte world should bring a good map, watch out for booby traps and carry a rabbit's foot for luck. **CIO**

You can share your thoughts on the petabyte future with Technology Editor Christopher Lindquist at clindquist@cio.com. Freelance Writer Fred Hapgood writes frequently about emerging technologies.

FOOD



Participating in an online goods exchange for the retail industry can make supermarkets' supply chains more competitive, says Albertsons CTO Bob Dunst. "We need to get critical mass and standardize how the industry does business," he says.

As they struggle for survival against discounters like Wal-Mart, supermarkets turn to IT to make shopping easier, cheaper and more profitable for them

FIIGHT

BY SUSANNAH PATTON

A generation ago,

you went to the bakery for bread, the butcher for meat and the general store for rice. Along with the groceries came a good dose of conversation and personal service. Then came the supermarket, where you could get your Wonder Bread, hamburger meat and Uncle Ben's under one roof. The personal touch was lost, but shoppers quickly gave up local gossip for the convenience of one-stop shopping.

Just as supermarkets killed your local butcher and baker—and drove most general stores out of business—grocery chains are themselves at risk of becoming obsolete. Now, Wal-Mart and other large discount retailers such as Target and Costco Wholesale make it so you can pick up a few lawn chairs, the latest DVD and some undershirts while you're out shopping for dinner. Low prices on staple items are increasingly driving shoppers to the giant discount stores, which in turn are opening up more grocery outlets.

Don't count out the supermarkets just yet, however. Traditional grocery chains—from number-one Kroger to small players such as Price Chopper and Hannaford Bros.—are betting big bucks that new technologies will help fend off Wal-Mart's assault. And while Wal-Mart is famous for its early and effective use of supply chain technology to keep costs and prices low, supermarket chains are working to distinguish themselves from the big discounters, which lack customer loyalty programs and rely on uniform pricing. The grocers, in addition to revamping their own supply chains, are investing in technologies that will boost customer loyalty, respond to local consumer needs and enhance the shopping experience.

"Supermarket operators are starting to focus on how we are going to be different," says Bob Schoening, CIO at Carteret, N.J.-based Pathmark, which is in the midst of a \$31 million across-the-board technology overhaul. "We have to answer the question: Why should people shop our stores versus Wal-Mart, where sheer buying power and systems can deliver items cheaper than we can?"

Reader ROI

- ▶ How Wal-Mart has changed the supermarket industry
- ▶ Why grocery chains are revamping supply chains
- ▶ Why grocery stores are trying other IT projects, from self-service checkout lanes to wireless applications

PHOTO BY STEVE SMITH

The ABCs of Grocery Retailing

Finding the answer to that question begins with a short history lesson. Wal-Mart, the world's largest company, built up its retail empire in the 1980s using a combination of shrewd business strategy and technological know-how. It invested heavily in supply chain technology before other retailers, and it lowered supply costs with its massive and efficient distribution centers. Wal-Mart's private exchange, known as RetailLink, provides suppliers with raw sales and inventory data to better manage stocking decisions and reduce costs of transactions within the supply chain. (For more about Wal-Mart's IT, see "The IT Inside the World's Biggest Company," at www.cio.com/printlinks.)

THE TOP 5

Wal-Mart reached No.1 in U.S. grocery sales in 2001

	sales (in billions)	U.S. market share
1. Wal-Mart	\$65.3	9.6 %
2. Kroger	\$50.1	7.3 %
3. Albertsons	\$37.9	5.6 %
4. Safeway	\$34.3	5 %
5. Ahold USA	\$23.2	3.4 %

SOURCE: SUPERMARKET NEWS

For supermarket owners, the scary part started 14 years ago when the Bentonville, Ark., mega-retailer expanded into groceries. Wal-Mart now has more than 1,000 of its so-called Supercenters, which include groceries, and this year claimed the number-one spot in the U.S. grocery market, according to the trade magazine *Supermarket News*. Wal-Mart beat out Kroger, Albertsons and Safeway, with an estimated \$65.3 billion in food sales in the fiscal year that ended Jan. 1, 2002. U.S. consumers spent \$682.3 billion on groceries last year, and Wal-Mart took 9.6 percent of the total receipts (and even more when you add grocery sales from Wal-Mart's Sam's Clubs stores).

That takes us to now, when the clouds continue to form over the supermarket parking lot: Wal-Mart is adding another 185 Supercenters this year and has started its lat-

est onslaught, opening 12 Neighborhood Markets, small groceries-only outlets, during the past year bringing its total to 35. Plans call for another 20 this year. Wal-Mart won't reveal expansion plans beyond that and declined to comment for this story, but analysts predict that Wal-Mart could have thousands within five to 10 years. The grocery-focused Neighborhood Markets present yet another challenge to grocery chains because they bring geographic convenience to Wal-Mart's recipe of gaining scale and volume—and the lowest prices—from its famed distribution infrastructure. Meanwhile, as Wal-Mart has gained ground organically, supermarket chains have sought growth by buying each other up, creating sprawling conglomerates with disparate IT systems.

While Wal-Mart is the leader, it isn't the only 800-pound gorilla out there. Discounters such as Target and Costco and niche supermarkets such as Trader Joe's, which focuses on discounted gourmet products, are also pressuring the traditional grocery chains. In an industry with razor-thin margins (the typical supermarket retailer makes a penny on every dollar of sales compared with Wal-Mart's 8 or 9 cents on the dollar), observers say supermarket chains must move ahead with their IT or move aside.

"Food retailers have to look at their IT and ratchet up their investment," says Pete Abell, a retail analyst at AMR Research in Boston. "They've been so far behind Wal-Mart and Target that unless they step up to the plate and spend 50 to 100 percent more, they will continue to fall behind."

On the Trail of the 800-Pound Gorilla

Grocers realized that they had to change the way they were doing business a decade ago, when many grocery chains hit a replacement cycle for an earlier generation of point-of-sale and in-store systems. But the introduction of technology hasn't always come easily. Because of the industry's narrow margins, companies have been slow to adopt new technologies. And as supermarket chains have merged and consolidated, they have

been stuck with multiple, nonintegrated systems. Adding to the complexity, many grocery retailers suffer from vast information gulfs, as disjointed distribution systems mean back-office operations rarely have a clear view of what is selling in the stores. Wal-Mart, by contrast, has driven efficiencies by centralizing its distribution system.

"The bringing of technology into the supermarket industry has probably been forced by Wal-Mart," says John E. Metzger, senior vice president and CIO at A&P, the 144-year-old Montvale, N.J., grocer, now in the midst of a \$250 million systems and supply chain overhaul that will ultimately replace a high percentage of its current applications in its 750 stores. "If we didn't start investing early on, we were absolutely dead."

Metzger, who before he was appointed CIO in February headed the company's tech revitalization program dubbed Evergreen, notes that a lot of activity has occurred in terms of supply chain investment in the industry, but that legacy systems are slowing down the process in some cases. Still, grocery industry CIOs agree that supply chain renovations remain an urgent priority, even if it won't mean catching up with Wal-Mart. Bill Homa, CIO at Hannaford Bros. in Scarborough, Maine, says that all grocers need to work on the supply chain in order to increase efficiencies and cut costs. "You don't have to be as good or better than Wal-Mart, but you better be in the ballpark," Homa says.

Hannaford Bros., like other grocery chains, took its first steps into supply chain automation with a warehouse management system (WMS) that allowed distribution centers to keep better track of inventory. In a typical scenario, a WMS is used in conjunction with bar coding and radio frequency scanners so that workers in a distribution center can use the RF scanners to locate the right merchandise for the right store.

In order to compete with Wal-Mart, grocers need to go several steps further with supply chain management and automated replenishment systems that can increase communication with suppliers and ensure that products remain in stock. Hannaford,

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Bill Homa, CIO at Hannaford Bros., says, "You don't have to be as good or better than Wal-Mart" when it comes to supply chain systems, "but you better be in the ballpark."

for its part, is now focusing on demand-driven replenishment with wireless technology from Symbol Technologies of Holtsville, N.Y. Using the Symbol units, store employees can communicate with the warehouse through a mainframe system in Scarborough and order grocery items that more closely fit the needs of individual stores. All of Hannaford's 115 stores are using the system for grocery items, and two stores are piloting it for perishables. "It's hard to beat Wal-Mart at their own game, which is price," says Homa. "If we focus on service as well as price, we have a chance."

Wal-Mart's RetailLink private exchange has allowed the company to reduce the cost of transactions within the supply chain by providing daily scan-data to suppliers, creating a system in which items are rarely out of stock. By contrast, many grocery retailers have 8 percent to 12 percent out-of-stocks because partners can't see the demand levels, says AMR Research's Abell.

Tom Nowak, senior vice president of IS and CIO at the Price Chopper Supermarkets chain based in Schenectady, N.Y., is working on that problem by implementing retail software that promises to reduce out-of-stock product levels and help the com-

pany maintain inventory levels based on customer demand. Price Chopper is in the first phase of implementing the software, from Industri-Matematik International, with the goal of having computerized ordering. "We'll have a better sense of our stock, and we're aiming for perpetual inventory," Nowak says. "At that point, the computer can take over ordering for the store people."

Wal-Mart's example with RetailLink gave rise to industry exchanges World Wide Retail Exchange and GNX, each of which counts dozens of grocery retailers as members. The public exchanges aim to reduce transaction costs through auctions and reverse auctions, in which the retailer solicits bids from suppliers for items that it needs. Kroger reported in its annual report that it had completed more than 300 reverse auctions in 2001, and Albertsons has also been active, buying a wide range of supplies by auction. Although some smaller chains are still waiting to see whether it is worthwhile to join, the larger players are pushing for wider adoption of the retail exchange to reduce gaps in supply chains. "Smaller players can get access to great technology through the exchange," says Bob Dunst, Albertsons executive vice president and

CTO. "We need to get critical mass and standardize how the industry does business."

Grocery chains such as Safeway and Wegmans have also been experimenting with a supply chain technique known as collaborative planning, forecasting and replenishment, or CPFR, in which manufacturers and retailers share information in order to develop one common, improved forecast, which then drives down replenishment and manufacturing costs. That approach is still young, but grocery retailers need to focus on such technologies that can improve collaboration with suppliers and trading partners—even if they can't lower prices to match Wal-Mart's.

"Grocery retailers must get their prices as low as possible, but they will seldom be able to match prices [with Wal-Mart] and survive," says Thomas Murphy, president of Peak Tech Consulting in Colorado Springs, Colo., and former vice president of IS at Kroger. "Therefore, they must concentrate on the strengths that can differentiate them from a Wal-Mart: product assortment, customer service and perishables."

Setting Themselves Apart

With Wal-Mart and other discounters focusing on getting the lowest prices, supermarket chains need to build up customer loyalty programs, invest in knowledge management projects and investigate pricing technologies that can set them apart. "Wal-Mart is everyday low prices to everyone," says Henry Vogel, a Chicago-based retail analyst for the Boston Consulting Group who notes that the retail giant has shied away from loyalty card programs. "Grocery stores need to play on this by segmenting their customers and actively targeting their promotions."

Loyalty card programs are becoming more and more common, but so far they

have been primitive for the most part. "Most chains have collected a lot of data but haven't gotten very good at using it," says Murphy. "They have a mass merchant mind-set rather than focusing on one-on-one situations."

That's starting to change. Larger chains such as Tesco of the United Kingdom, Kroger, Safeway and Ahold USA are all working on tests that target promotions and pricing based on loyalty programs. Stop & Shop, a Quincy, Mass.-based chain owned by Ahold USA, which is itself a unit of the Netherlands' Royal Ahold, has recently spent millions to develop a data warehouse that allows the company to send out targeted direct-mail offers, offering discounts on diapers for shoppers with babies or ice cream to those with a sweet tooth.

Under siege from big national discounters, grocery store chains are overhauling supply chains and experimenting with biometrics, self-service and other technologies.

Even some smaller chains are getting into the CRM fray. Price Chopper, for example, provides real-time information to customers on their loyalty points balance, which shoppers can amass for greater savings or rewards. Using software from Shelton, Conn.-based VRMS, Price Chopper is able to mine customer data in order to send out targeted offers. For example, if a customer has shopped regularly at Price Chopper for three years and then stops, the company can send that customer offers to entice her back. Or if a customer shops at Price Chopper, but never buys produce, it can send that person some produce coupons.

Price Chopper won't reveal how its customer loyalty program has affected its bottom line, but insists it has been beneficial.

Grocery chains should also focus on providing the best assortment and product placement for their customers. One way to do that is to use software that sets prices

based on customer demand, a sharp contrast to Wal-Mart's lowest retail across-the-board philosophy. D'Agostino Supermarkets, a family-owned 23-store chain in New York City, says it has seen revenue grow 9.7 percent and gross profit dollars rise 16.1 percent since it started using software from DemandTec of San Carlos, Calif. Such software helps D'Agostino and others understand which grocery items are key to their customers so that promotions are successful.

At Giant Eagle stores, based in Pittsburgh, the IS department has been working with colleagues in the retail operations group on a knowledge management project they hope will boost the chain's competitive edge by allowing individual stores to share money-saving practices. "We're facing competition

all along the line from the new mass market, including Wal-Mart, Costco and Target," says Bob Garrity, senior vice president of IS at Giant Eagle. "We're always looking for opportunities that will help us stay competitive by improving customer service."

Giant Eagle began work on the knowledge management project four years ago and kicked off its pilot program two years later. Now, 120 of its 216 stores are equipped with new PCs so that employees in the meat, dairy and produce departments can log on to the company portal, known as KnowAsis, and share or receive tips on product assortment and how best to arrange products. The company invested \$1.5 million in new PCs and says the entire initiative has cost more than \$2 million. Giant Eagle has already seen an ROI from the project, says Bob Guy, director of retail operations, information and knowledge. He declined to provide a number but says the company no longer has to

publish some 200 procedure manuals (such as how to cut meat or arrange products on display) because they can now be automatically updated online. So when the chain decides to change the "planogram" for its meat department displays, it can now send out digital photographs instead of sending someone out to each store.

Supermarkets of the Future

Ask people what bothers them most about their local supermarket, and they're likely to reply: long lines, empty shelves and missing price tags. To address those complaints, among others, supermarket retailers are asking shoppers to do a lot of things themselves. Bar codes and scanners are giving way to self-checkout lanes, where shoppers scan and pack their own paper or plastic shopping bags. Internet kiosks offer store information and allow shoppers to preorder cold cuts from the deli counter or locate hard-to-find items. In some stores, you can pay without taking out your wallet by using a biometric fingerprint system. While some of these technologies are still unproven, supermarket chains should be experimenting with them to improve the shopping experience and to save money by cutting down on labor costs.

Kroger started testing a biometric payment system in April in three stores near Austin, Texas, and says early indications show that customer acceptance is good. Customers who have enrolled in the program pay for groceries by punching in their password, swiping their loyalty card and placing their finger in the device from Roundrock, Texas-based Biometric Access, which charges the customer's credit card. "This kind of new technology improves customer service and

peer resources

If you think that grocers have a hard time getting updated, read the reactions of customers to the high-tech world of self-checkout in **CONSUMER CHAIN OF COMMAND**. Find it at CIO's online sister publication, **DARWINMAG.COM**, or go to www.cio.com/printlinks.

The Grocers Strike Back

In their epic battle against big discounters, grocery chains around the country have deployed an army of IT projects to fill orders faster, freshen up the aisles and cut costs

KROGER

BASED IN: Cincinnati
ANNUAL SALES: \$50.1 billion
STORES OWNED: 2,392



I.T. HIGHLIGHT: Experimenting with biometrics. Kroger has started pilots in three of its Texas stores in which registered shoppers can pay for groceries using a biometric finger scan.

ALBERTSONS



BASED IN: Boise, Idaho
ANNUAL SALES: \$37.9 billion
STORES OWNED: 2,541

I.T. HIGHLIGHT: Expanding its loyalty card program from 100 Illinois area stores to other states. Albertsons uses the data to create personalized special offers.

AHOLD USA

BASED IN: Chantilly, Va.
ANNUAL SALES: \$23.2 billion
STORES OWNED: 1,600



I.T. HIGHLIGHT: Company's Stop & Shop chain, based in Quincy, Mass., is testing a wireless Internet tablet that is attached to shopping carts. Shoppers can order items from the deli or surf the Net while they stroll the aisles.

HANNAFORD BROS.

BASED IN: Scarborough, Maine
ANNUAL SALES: NA; (parent company, Delhaize Group of Brussels, Belgium, sales were \$21 billion in 2001)
STORES OWNED: 115



I.T. HIGHLIGHT: Using wireless technology to improve ordering practices. Stores use wireless devices that connect to a main-frame-based inventory system to order grocery items. Some stores are starting to use the system for perishables.

A&P

BASED IN: Montvale, N.J.
ANNUAL SALES: \$11 billion
STORES OWNED: 797



I.T. HIGHLIGHT: Company is in the midst of a \$250 million systems and supply chain overhaul.

GIANT EAGLE

BASED IN: Pittsburgh
ANNUAL SALES: \$4.5 billion
STORES OWNED: 216



I.T. HIGHLIGHT: Company is rolling out a knowledge management system to 35,000 employees who will be able to share best practices online.

PATHMARK

BASED IN: Carteret, N.J.
ANNUAL SALES: \$4 billion
STORES OWNED: 144



I.T. HIGHLIGHT: Company is in the midst of a \$31 million across-the-board IT overhaul that includes replacing infrastructure such as frame-relay systems, data warehouse and procurement systems, as well as in-store technology such as point-of-sale systems and self-checkout.

PENN TRAFFIC

BASED IN: Syracuse, N.Y.
ANNUAL SALES: \$2.4 billion
STORES OWNED: 216



I.T. HIGHLIGHT: Has internet kiosks in six of its stores to allow shoppers to order hard-to-find items.

PRICE CHOPPER

BASED IN: Schenectady, N.Y.
ANNUAL SALES: \$2 billion (estimated 2002)
STORES OWNED: 102



I.T. HIGHLIGHT: Uses retail software from Industri-Matematik International to manage store replenishment for all of its stores with the goal of reducing out-of-stock product levels.

D'AGOSTINO SUPERMARKETS

BASED IN: Larchmont, N.Y.
ANNUAL SALES: \$175 million (estimated 2001)
STORES OWNED: 23



I.T. HIGHLIGHT: Implemented price optimization software from DemandTec in order to match prices to demand, thus increasing sales. As a result, the chain could lower prices on high-volume items and offset the loss with slightly higher prices on items customers perceived as specialty.

reduces cost by speeding up service," says Gary Huddleston, manager of consumer affairs for Kroger in Texas and Louisiana.

Stop & Shop has been testing wireless Internet tablets that allow customers to order deli items from an aisle, log on to the Internet while they are shopping and find out what's on sale in the store. The chain reports that eight out of nine customers using the system liked it and would use it regularly.

Internet kiosks have had mixed results, but grocers see potential. Syracuse, N.Y.-based Penn Traffic, which has 216 supermarkets in the Northeast, has installed kiosks in six of its stores in a pilot program. The kiosks, known as Endless Aisle, allow customers to order products they can't find, such as imported or gourmet foods. Penn Traffic says it is still evaluating the pilot, but Stop & Shop, which also piloted Endless Aisle in six of its stores, says it has found that customers are using the service more often from their home computers than from the store kiosks.

Looking ahead, grocery retailers are eyeing radio frequency identification, or RFID, a "smart tag" technology that could replace 30-year-old bar codes. So far, RFID is too expensive to tag all individual merchandise, but trial runs at companies such as the Marks and Spencer Group, one of Britain's largest retailers, show it can pay for itself in increased efficiencies and less spoiled food when used on containers that carry food from suppliers to stores. RFID devices contain computer chips that can store a much larger amount of data than bar codes. If it catches on and the price comes down, shoppers could conceivably check out without removing items from the cart and grocers could more easily track their merchandise as it flows through the supply chain.

Says Pathmark's Schoening: "It's not for tomorrow—or maybe not even for five years. But the possibility is there to revolutionize the way we operate supermarkets." **CIO**

SOURCES: INTERVIEWS, COMPANY WEBSITES AND SUPERMARKET NEWS

Senior Writer Susannah Patton (spatton@cio.com) profiled A&P's ERP overhaul ("Can IT Save A&P?") in our Feb. 15, 2001, issue.

STRATEGIC DIRECTIONS



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p.6

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MANAGEMENT p.11

Data Storage: Collect & Protect

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RETHINKING

ENTERPRISE STORAGE STRATEGIES

Today, about 80 percent of all data starts out digital, what with mushrooming use of e-mail and the need to maintain all those e-mail archives. And data-intensive information types — graphics, digital video, etc. — are commonplace as communications go paperless and Web content becomes richer.

Then there's the need to collect and rationalize data about customer interactions and the demands of ever-larger operating systems and applications supporting 24/7 information access.

Simply put, to quote Wesley Bertch, director of software operations at Minnesota-based Life Time Fitness Inc., "Data storage is the key to IT."

Yet data storage systems remain mostly isolated and under-managed. And although storage device and media prices continue falling even as densities improve, storing data is costing organizations the bulk of their IT budgets.

"The share of IT budgets devoted to storage has risen to 50 percent," says Andy Grolnick, vice president of marketing at Quantum's DLTape Group. "Of that 50 percent, 90 percent is spent on storage management — primarily people costs."

That's because, in too many enterprises, data storage facilities have

grown haphazardly in stovepiped IT environments: Stores are directly attached to servers or exclusive to particular business units, requiring duplicate systems and staff. Also, many organizations utilize only about 60 percent of their data storage, often because spare storage space on one server can't be used elsewhere. And the cost of managing storage is now about eight times more than the purchase price of storage hardware, according to Gartner Group.

of storage into a network-attached storage [NAS] or storage area network [SAN] array alone are typically limited to centralization of administration.

"However, when combined with additional services for virtualization, data protection and business continuity, the increase in both cost savings and business flexibility can have powerful impacts," Hall adds.

Storage consolidation is also critical to executing a server consolidation strategy, Hall says. And this, he

THE LARGER AND MORE DISTRIBUTED THE ENVIRONMENT, THE GREATER THE POTENTIAL COST SAVINGS FROM STORAGE CONSOLIDATION.

Clearly, something's got to give — and it's not going to be the increased demand for data storage.

SOLUTION: CONSOLIDATE

Centralizing data storage is an imperative for most organizations, says Quantum's Grolnick. "When a resource becomes that valuable, that important to the organization, it simply makes sense to centralize it and consolidate its management," he says.

Generally, the larger and more distributed the environment, the greater the potential cost savings from storage consolidation, points out Dave Hall, CTO at Dallas-based CompuCom. "The benefits of physical consolidation

notes, not only improves overall server utilization; it can produce significant savings in reduced maintenance contracts, software licensing and operational support costs.

"Obviously, the more you can reduce hardware, the more your costs go down," says Dave Kessler, IT director at HOK S+V+E, a large, Kansas City, MO-based sports facility design firm (see the case study about HOK S+V+E on Page 9). "Moving to a storage area network enabled me to reduce the number of servers I had compared to our direct-attached storage environment. Think of the amount of hassle when 15 servers need updating instead of five — that's a huge amount of IT work saved."

DATA STORAGE: COLLECT & PROTECT | RETHINKING STRATEGIES

And it can add up fast.

Incyte Genomics, a California company developing new treatments for cancer, diabetes and other diseases, integrates lots of data from many disparate sources to support its research. It needed a comprehensive information storage infrastructure that would consolidate its existing environment while also increasing performance, availability, capacity and manageability. EMC's solution took up half the space of its predecessor while doubling Incyte's data storage capacity — from 28 to 56 terabytes. It also integrates data generated from several different operating systems.

Oracle Corp. turned to EMC to help handle more than 240 terabytes of data storage in 43 data centers worldwide. Using multiple EMC products, including Symmetrix, Connectrix, Celerra file server, TimeFinder and PowerPath, these centers were consolidated into a dual data center environment that has cut downtime, making core applications continuously available. By centralizing server storage, Oracle has lowered power consumption and floor space by 30 percent.

ADVICE: KNOW YOUR STORAGE DEMAND

Companies that aren't organized as distinct lines of business under a port-

folio model should centralize IT systems and storage where possible to achieve economies of scale and simplify administration and security, advises Bertch of Life Time Fitness. "Look for alternative solutions to onboard server storage," Bertch says.

It's essential, believes CompuCom's Hall, to know which users and applications generate data storage demand. "Only after gaining a comprehensive understanding of how the organization uses storage capacity today," he says, "can the savvy CIO adapt IT policy and deploy new infrastructure to manage the utilization and cost of data storage allocation in the future." **SD**

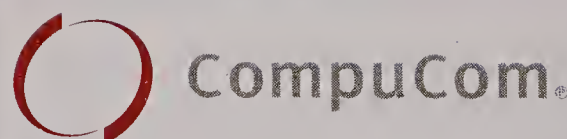
COMPANY PROFILE

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Like many other technologies, there is no one storage solution that addresses every need appropriately. There are different applications specifically suited to SAN, NAS, tape, and optical storage technologies. The solution selected must address the functionality, availability, and performance requirements of a given need. Sometimes this can be

accomplished through a single solution; more often it takes several technologies deployed across the environment. The key is to have a solid storage management strategy that unifies the operational support of all storage in the environment.



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CompuCom's strategic storage partnerships include Hewlett-Packard (both HP and Compaq pre-merger), IBM, Brocade, Computer Associates, VERITAS, and Legato. In 2001, CompuCom was recognized by Compaq as its #1 Reseller of SANworks Software in North America and as the #1

Reseller of StorageWorks in its North American Central Region. In 2002, CompuCom gained acceptance into the Computer Associates (CA) Solution Partner Program, which places CompuCom as one of a select few that can sell CA's Enterprise BrightStor Storage Solutions.

COMPUCOM UNDERSTANDS THE CHALLENGES SURROUNDING STORAGE MANAGEMENT

CompuCom delivers world class enterprise storage solutions that meet the unique business and technology requirements of clients. From strategic consulting to implementation and support, CompuCom helps clients develop and execute custom-tailored enterprise storage strategies that address the business and financial challenges of storage management.

CompuCom partners with storage industry leaders to deliver comprehensive, integrated solutions that result in measurable cost savings, increased productivity and business flexibility. Areas of expertise include:

Since 1987, CompuCom has been providing America's leading organizations with top-quality and cost-effective products and innovative services to maximize their technology investment. In 1988, CompuCom was the first company to combine custom configuration services with procurement processes. Today, CompuCom is a financially stable, \$1.8 Billion organization that has continued to combine product acquisition and fulfillment capability services with an outstanding national IT solution delivery organization to quickly and effectively design, build, deploy and operate IT systems.

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CompuCom



i n v e n t

DATA STORAGE: COLLECT & PROTECT | PEAK PERFORMANCE

PEAK PERFORMANCE

NAS, SAN OFFER OPTIONS FOR MAXIMIZING STORAGE

Once an organization's storage needs pass the million megabyte mark, traditional direct-attached storage becomes a nightmare.

Information is isolated in stovepiped databases. Data backup requires system downtime that no one can figure out when to schedule. Management is time-consuming and demands platform-specific skills. Much storage space remains unused because it can't be shared or reallocated. And then storage traffic clogs the corporate local area network.

No wonder organizations are turning to storage networking to support information- and content-intensive applications that pull in and push out large amounts of data.

Separating storage from servers enables organizations to deploy storage resources according to business needs rather than technical constraints. Two current approaches prevail.

NETWORK-ATTACHED STORAGE. Network-attached storage (NAS) appliances offer a low-cost, reliable, fast solution to some of the worst problems

associated with direct-attached storage — multiple server platforms can interface with the same NAS appliance, and NAS management is comparatively simple. In fact, many plug into existing networks in minutes.

A Quantum NAS appliance, the Snap Server 1000, did the trick for the American Cancer Society in Baltimore, which needed additional storage for its 20-server network but couldn't afford conventional storage servers priced around \$8,000 each. Weighing in at three pounds and 10G of storage for \$500, the Snap Server saved \$150,000

and workgroup environments where there is little or no server management staff are sweet spots for NAS solutions due to their simplicity in deployment and management. In large enterprises, NAS can be used in server consolidation of existing file servers, reducing the server footprint and in some cases increasing performance."

At The Bekins Co., an international relocation firm that generates 10,000 documents a day, microfilm archiving had been traded in for an imaging system that digitized and stored the documents on a mainframe

SEPARATING STORAGE FROM SERVERS ENABLES ORGANIZATIONS TO DEPLOY STORAGE RESOURCES ACCORDING TO BUSINESS NEEDS RATHER THAN TECHNICAL CONSTRAINTS.

and about 100 hours of installation time.

But because NAS appliances run on the corporate LAN, they can create congestion and bottlenecks. They're also tough to scale: When a NAS appliance runs out of space, it's time for a platform upgrade.

"NAS is ideally suited for file-sharing based environments," says Joe Ploehn, storage consultant at Compu-Com. "Small businesses, departments

— but it took just 90 days for the mainframe's DASD storage to fill up. Bekins considered an optical jukebox system, with a pricetag around \$100,000, but invested instead in a network-attached storage alternative, a Quantum Snap Server that plugged right into the company's network and cost only \$3,000.

Those, however, who need terabytes or even petabytes of storage or simultaneous access to multiple files,

THE EVOLVING FABRIC OF STORAGE NETWORK ARCHITECTURES

AN OVERVIEW OF TODAY'S SOLUTIONS — AND TOMORROW'S

HERE AND NOW

SCSI (SMALL COMPUTER SYSTEMS INTERFACE): Both a protocol and a physical transport, it's the technology on which most server-attached storage is based — but it's constrained in speed, distance, scalability and connectivity.

FIBRE CHANNEL: The high-speed, flexible, scalable networking alternative on which storage area networks (SANs) rely; supports transport of multiple upper-level protocols.

An intelligent fibre channel fabric switch can connect up to 16 million nodes, like threads woven into a fabric, and permits high degrees of fault tolerance handled via host-based high-availability and volume management software. Continued access to stored data during component failures is enabled by hardware RAID and disk-mirroring capabilities.

Fibre channel SANs can increase I/O performance, and they facilitate centralized storage management and lower storage administration costs. Most fibre channel devices (host bus adapters, switches, disk arrays, etc.) now support second-generation 2Gbps speeds and 10Gbps is coming.

ON THE HORIZON

IP-BASED STORAGE NETWORKING

Several protocols are emerging:

- **iSCSI (Internet small computer systems interface)** enables block-level transfers over IP backbones at speeds of 1Gbps, thus linking SANs to IP networks. Advantage: enables consolidation of all SANs into a single IP-based network.
- **FCIP (fibre channel over IP)** protocol encapsulates a fibre channel and tunnels it through IP networks. Advantage: enables WAN connectivity between SANs, overcoming fibre channel's 10-kilometer distance limitation.
- **IPFC (IP over fibre channel)** encapsulates IP packets in fibre channel frames. Advantage: facilitates IP communications over fibre channel networks.

INFINIBAND: A high-speed, channel-based, switched-fabric I/O transport architecture designed to enhance communications between peripherals and servers, removing network bottlenecks. But not yet ready for prime time. Advantage: better scalability, greater bandwidth boosts performance, multiple paths improve reliability, supports managing components from multiple vendors in a single fabric.

VI (VIRTUAL INTERFACE): The plan: enable server-to-server communications with minimal CPU resources; VI allows direct memory-to-memory transfer and direct application access without involving an operating system. Advantage: can work with fibre channel, gigabit Ethernet, Infiniband.

DAFS (DIRECT ACCESS FILE SYSTEM): Based on VI architecture, DAFS enables clustered application servers to share data without taxing operating system resources; typically used in a local data center environment rather than a wide area network.

DATA STORAGE: COLLECT & PROTECT | PEAK PERFORMANCE**COMPANY PROFILE****A PARTNER WITH COMPREHENSIVE NETWORKED STORAGE SOLUTIONS**

The rise of enterprise applications such as CRM, ERP, and SCM, has made the success of many companies heavily dependent upon their ability to access mission-critical data — when and where they need it. However, many companies are unable to align them with new applications and corporate objectives, because they struggle to manage their information assets from a business perspective.

As the volume of data grows exponentially and more applications are moved online, companies of all sizes need to gain control of their complex environments, increase productivity and optimize unrecognized ROI. Companies searching for a partner with comprehensive networked storage solutions — including SANs for applications like data warehousing and OLTP; NAS for file sharing and collaboration; and Content Addressed Storage (CAS) for fixed content assets through integrated content management applications — have one in EMC.

A SINGLE INFORMATION STORAGE INFRASTRUCTURE

EMC Corporation is leading the networked storage evolution with the most robust storage platforms and open management software through its

AutolS strategy. EMC's automated networked storage solutions combine the broadest range of storage networking technologies (SAN, NAS, and CAS), storage platforms, software, and services to enable organizations to better and more cost-effectively manage, protect, and share their information.

In addition, these networked storage solutions enable companies to

connect their many diverse servers, applications, and operating systems into a single information storage infrastructure; manage and consolidate the explosive growth of file-based data (such as e-mail, web content, and user directories filled with documents); and preserve and manage data that can never change such as MRIs and X-rays, check images, broad-

cast content, and completed CAD/CAM designs.

Companies need to consolidate storage resources, improve manageability and control IT costs, integrate and share data across diverse business applications and eliminate business disruptions while ensuring business continuity. For advice and assistance with these challenges and opportunities many companies are partnering with EMC. EMC is the only company entirely dedicated to delivering comprehensive automated networked storage solutions.

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such as CAD drawings, streaming audio/video or medical images, may require a different solution.

STORAGE AREA NETWORKS. A separate, dedicated network that enables multiple servers to share many high-speed storage devices, a storage area network (SAN) replaces one-to-one SCSI connections between servers and storage devices with much faster fibre channel links that handle large volumes of block-level data, freeing corporate LAN resources for operational traffic.

Thus an organization's SAN capacity can evolve and scale independently of server usage, and multiple servers can share a storage device.

That's not all. Because they offer

redundancy, mirroring, hot-plugging capabilities and no single point of failure, SANs provide the fault-tolerance necessary to improve business application availability. Fault monitoring, diagnostics, intelligent routing and rerouting, dynamic failover protection and nondisruptive server/storage maintenance and repair means that SANs also speed data recovery with minimal staff intervention.

The SAN designed and implemented by Minnesota-based Datalink for Kemper Insurance of Illinois using Hitachi RAID storage, Qlogic and IBM host bus adapters, and Brocade's fibre channel switches delivered I/O increases of up to 300 percent while

manual task requirements declined.

New York Life reports that its move from direct-attached storage to an EMC storage area network improved performance, availability and network monitoring capability as well as saving "a couple of million dollars" in storage equipment costs.

But SANs are complex, especially when multiple hosts are involved, and interoperability standards are still emerging. Fortunately, demand for SAN interoperability has generated movement.

■ Vendors are starting to share. IBM and Hewlett-Packard, for instance, have cross-licensed APIs (application programming interfaces) on their stor-

DATA STORAGE: COLLECT & PROTECT | PEAK PERFORMANCE

age network management software and high-end storage arrays, which enable them to interoperate more easily within storage area networks.

■ The Storage Networking Industry Association is hard at work on Bluefin (now dubbed the Storage Management Interface Specifications), a set of APIs that uses the Common Information Model (CIM) and the XML-based Web-Based Enterprise Management (WBEM) standards to support device discovery, monitoring and management. Bluefin, which was written by 11 storage vendors, including Dell, EMC, HP and IBM, will allow administrators to use a single set of storage management tools to control software and hardware from a variety of vendors.

SAN MEETS IP

Designing SANs that will operate using the Internet protocol promises to prevent vendors from locking customers into proprietary architectures.

What's more, IP-based SAN means that organizations can leverage the management tools and core infrastructure built to manage IP networks while still enjoying the benefits of a separate storage-only network. IP-based SANs can also be interconnected across metropolitan and wide area networks.

Finama Asset Management's iSCSI SAN (based on Cisco Systems' storage routers), in which the iSCSI protocol acts as the interface between network servers and SAN storage devices, has enabled the French firm to boost server availability and consolidate its storage.

Minneapolis-based Carlson Cos. (whose brands include Radisson and TGI Friday's) uses 12 Nishan Systems IP-to-fibre channel switches and a couple of Cisco Systems gigabit Ethernet switches to power an iFCP (Internet fibre channel protocol) SAN infra-

structure connecting 28 servers and Hitachi storage gear. Now application availability, at 99.98 percent, is meeting expectations.

NAS/SAN CONVERGENCE

NAS and SAN provide access to stor-

age in distinctly different ways, notes CompuCom's Ploehn. NAS is a file serving application, allowing storage access to users and applications through file system protocols such as NFS and CIFS. SAN is an architecture that presents raw-disk logical unit numbers to

CONSOLIDATING STORAGE AT HOK

HOK S+V+E, a Kansas City, MO-based architectural firm that has designed many well-known sports facilities, including the home stadiums of 54 professional football and baseball franchises, recently installed a Dell/EMC storage area network (SAN), adding about two terabytes of additional storage space.

The SAN, implemented with the help of Dell Professional Services, is part of a server consolidation project in which HOK S+V+E has retired a number of older servers and replaced them with fewer, more powerful ones.

"We were spending a lot of money on servers when all we needed was storage," says Dave Kessler, IT director at HOK S+V+E, who has been dealing with storage issues since the late '70s. "By reducing the number of servers, I have fewer points of failure, don't need to pay for as many Microsoft Windows 2000 server installs, have less maintenance because there's fewer boxes, and I don't need to increase my staff."

Kessler's group serves about 270 users at HOK's Kansas City location and another 135 overseas. SAN is the storage environment of choice for HOK's Kansas City locale; its Exchange database is on the SAN, as are its other database applications running SQL Server. According to Kessler, on a typical day HOK alters at least a couple hundred gigs of data.

HOK's architects, Kessler explains, don't download drawings to their machines, work on them and put them back. "They work on the drawings directly off the storage — we've got a lot of traffic going on all day long."

And sometimes all night too. "We don't literally have a 24/7 operation here, but we are mighty close," he says. "Architects in our line of business work around the clock. If I take a server down at one in the morning on a Wednesday, there's a good chance there's someone I'm affecting and, believe me, I will hear about it."

Kessler is pleased with the way HOK's consolidation has eased backup woes and brought new perspective.

"Storage is a big issue," Kessler notes. "One of the things we realized is that we needed to start applying some rationality to storage use — to manage it, not just keep throwing resources out there and letting people do what they please."

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servers to provide scalable storage that appears to be directly attached.

"The strength of NAS appliances is their optimized, multiprotocol file servers, while SAN offers high flexibility for server-based storage," Ploehn says. "Many vendors are integrating NAS appliances as a front end to SAN-based storage, thereby taking advantage of the best of both technologies."

For instance, EMC's Celerra NAS server relies on EMC's Symmetrix array for storage. Veritas' ServPoint Appliance for SAN mediates between LAN clients and a back-end fibre channel SAN, serving block-level data to users. Auspex offers the NSc3000, a LAN-resident network storage "controller" that connects to fibre channel-

based disk arrays from multiple vendors, including EMC, Hitachi Data Systems and HP/Compaq. And from Network Appliance comes a new product that supports both traditional file-level data transfers (via IP connectivity) and block-level data transfers via fibre channel SAN connectivity.

Chuck Hollis, vice president of markets and products at EMC, anticipates many enterprises combining NAS and SAN.

"They'll build a SAN that offers predictable performance and supports block-mode access to those applications that demand it," Hollis says. A portion of their SAN capacity may be front-ended by a clustered NAS device that consolidates file servers and low-

ers the cost for a storage connection. "Also, we're seeing many more implementations of multipath file sharing, where files are accessed under NAS but delivered via a SAN for performance reasons," Hollis says.

Getting the benefits of networked storage, Hollis says, boils down to three requirements: scale, scope and skills.

Scale means being able to get big — "the bigger the consolidation, the bigger the savings," he says. Scope is having all the hardware and software components prequalified and pre-integrated to build a complete solution. Skills is working with someone who's designed, built and supported a large, complex mission-critical networked storage environment. **SD**

CASE STUDY**TOTAL TIME TO BACK UP DROPS FROM HOURS TO MINUTES**

Quantum Corporation's DLTape and Super DLTape tape drives and media cartridges are ubiquitous. There are over 2 million drives out there, along with some 80 million media cartridges. They're in over 90% of all Fortune 500 companies. They are the standard for backup and archiving, the basic data protection building blocks for most businesses. Beyond that, developers of DVDs store and ship their programs on DLTape. Manufacturers use them to store large Computer Aided Design (CAD) files. And millions of medical images, from X-rays to CT scans, are stored on DLTape and Super DLTape media.

DLTape and Super DLTape technologies are not just for giant organizations. Lifeline Systems Incorporated, in Framingham, MA supplies emergency response systems that allow subscribers to call for help with the push of a button. For tens of thousands of people, many of them elderly, Lifeline Systems lets them live independently, yet with the security of knowing they can always call for help.



Larson, Manager of Network Services at Lifeline, "for its storage density, speed, and ability to let us get our data off-site. By going to Super DLTape technology," says Larson, "we have been able to go to a centralized backup strategy using just two SDLT 220 drives. With the higher density and performance of Super DLTape technology, we have cut down our media requirements and shortened our backup windows, which is critical, because we are a 7x24 business.

"We run dual data streams to the SDLT 220 drives," says Larson. "That doubles our data transfer speed. First we back up our SAN to disk. That creates one great big glob file. Then we stream that onto tape. Streaming one big file lets us get top performance out of the Super DLTape drives. For our Microsoft Exchange 5.5 server, we've cut our total time to back up from 6 hours down to 50 minutes to back up to disk and 23 minutes to stream to the SDLT-220 drive."

"We went to Super DLTape technology for density and speed, but also for backward compatibility. We need to hold on to our tapes for years, for legal reasons, so continuity is important."

DENSITY, SPEED, BACKWARD COMPATIBILITY

"We've been using DLTape technology for many years now," says Jim

For more information on DLTape technology visit
www.quantum.com

MASTERING STORAGE MANAGEMENT

BE PROACTIVE, NOT REACTIVE TO STORAGE DEMANDS

Consolidating storage can reduce administrative costs and increase the amount of data that can be managed by anywhere from three times to 50 times, according to Gartner research.

But, says Scott Robinson, chief technology officer at Minnesota-based Datalink Corp., “Organizations have often reacted to the demands of storage tactically and have ended up buying all kinds of storage devices. Even if they’ve bought the right components, many struggle to pull it all together.”

Which means it’s time to develop a data storage strategy with storage centralization and management at its center.

Because centralization results in a single storage infrastructure controlled with management software, backup and archiving capabilities improve storage processes, and the variety of technologies used gets rationalized. Storage management software also delivers a clearer view of storage usage and enables chargeback based on utilization.

For instance, a large manufacturing company with over 100 terabytes of open systems storage used Storage

Networks’ software and services to push up asset utilization from 25 percent to 70 percent in just 12 months — saving more than \$10 million in new purchases alone.

STORAGE VIRTUALIZATION

Storage configurations can be simplified by creating a logical view of physical storage resources — arrays from diverse vendors on different platforms are

WHAT’S YOUR DATA STORAGE POLICY?

Storage policies encompass everything from articulating and managing business goals to building service-level agreements (SLAs) and overseeing computer rules, agents and scripts. Enforcing storage policies can make complex storage architectures easier to manage with a calibrated combination of automation and intervention, advanced reporting capabilities and improved quality-of-service processes.

Some advice from the experts:

GET NETWORKED. Direct-attached storage can’t be shared and must be individually managed. Networked storage offers the means to consolidate, rationalize and manage storage resources.

INSTALL STORAGE MANAGEMENT SOFTWARE. Key to an effective data storage policy is management software that automatically discovers storage resources and displays the results in both logical and physical views. Only when this is complete can administrators apply specific policies across sets of data, directories and applications.

BUILD A BUFFER. Storage consultants suggest keeping about 20 percent of available disk space unused on storage devices and servers. This helps ensure that files are written in continuous blocks rather than spread across several data volumes, making file access faster.

REMEMBER: EVERY APP IS DIFFERENT. Various application requirements and behaviors impact storage demand and affect capacity management in different ways. An enterprise’s data storage policy must reflect this.

DATA STORAGE: COLLECT & PROTECT | MASTERING STORAGE MANAGEMENT

grouped so they can be managed from a central point as a single storage pool.

This is storage virtualization, most commonly applied to network-attached storage (NAS) or storage area network (SAN) devices. It enables expansion and reallocation of storage resources on the fly without requiring downtime; a single point of control reduces management complexity and cost.

"With virtualization in place," says Robinson, "online transaction process-

ing and e-business applications, both high-performance and high-availability applications, would be assigned high-performance/high-availability storage solutions. Low-performance/low-availability applications, such as archive files, would be assigned to lower-performance/low-availability storage solutions."

STORAGE RESOURCE MANAGEMENT

Using a single, centralized view, storage resource management (SRM) soft-

ware monitors, measures and controls both physical resources (storage devices) and logical resources (data units) and activates policies that prevent service interruptions and anticipate future requirements.

SRM thus reduces the complexity of storage management — and generates cost savings — in several ways:

- Locating all storage resources and ensuring that appropriate storage resources are available when and where

CASE STUDY

STORAGE CONSOLIDATION: THE KEY TO OPTIMIZING STORAGE MANAGEMENT BENEFITS

"S

torage consolidation is the answer to dealing successfully with the challenges of information hyper-growth because it helps companies optimize their storage infrastructures," says Scott Robinson, chief technology officer at Datalink Corporation. Without consolidation, he argues, the full benefits of storage management will not be realized—no matter how much storage management software or IT resources a company throws at the problem.

An information storage architect, Datalink analyzes, designs, implements, and supports information storage infrastructures that store, protect, and provide continuous access to information.

According to Robinson, achieving a storage environment that's manageable, whether new or improved, starts with building an infrastructure that's inherently manageable.

"Now I realize that sounds like stating the obvious," he continues. "However, we routinely meet users who implement SAN, NAS, and DAS solutions only to find out after the fact how difficult it can be to manage all of the disparate devices and networking technologies. But layering management software over a poorly designed infrastructure will not produce optimum benefits; the infrastructure must be addressed."

A MANAGEABLE INFRASTRUCTURE

So, for example, when a Datalink customer with no management software and 75 small RAID systems wanted to improve its storage functionality, the first thing Datalink did was help them create a more manageable infrastructure by consolidating their current storage environment with a storage area network.

"In this case, the customer was able to consolidate 75 units into just 3 large RAID systems, grow capacity, get better utilization and dramatically increase the amount of storage administrators could manage—from 1.5 terabytes per administrator before consolidation to 17 terabytes per administrator after,"

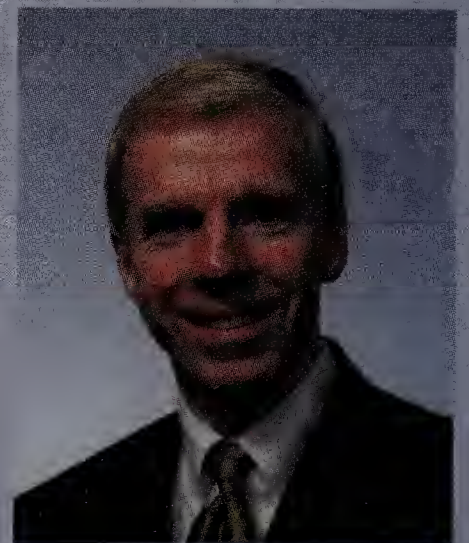
he reports. "Now, with an optimized infrastructure, they can move forward and best determine how to further virtualize storage as well as how to layer additional storage resource management to achieve even more benefit.

"The statistics I've seen show the amount of storage needing to be managed growing much faster than the number of administrators to manage it — therefore improving their productivity becomes critical."

Robinson believes it's absolutely essential that CIOs examine storage infrastructure with an eye to making it as manageable as possible.

"Storage consolidation is how CIOs can create an optimized storage infrastructure — as the first step in storage management. Slapping software onto an ill-conceived infrastructure is not an answer," observes Robinson.

Headquartered in Chanhassen, Minnesota, Datalink has twenty-five offices serving the entire United States.



Scott Robinson, CTO, Datalink

For more information, visit www.datalink.com.

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they're needed makes server consolidation possible

- Finding and allocating unused storage assets adds capacity without new equipment
- Maximizing storage capabilities boosts service levels, which improves application performance and availability
- Using storage configuration changes during scheduled maintenance that minimally affect end users improves storage availability and averts unplanned downtime.

The payoffs can be substantial. Consider Boise Cascade's experience: On its way to implementing a SAN,

the company used StorageCentral SRM from WQuinn Inc. (acquired by Precise Software Solutions) to make use of 20G of wasted space on its primary file server and to cut its full-back-up window, which had ballooned to 24 hours, by a third. These days, the SRM software sends alerts to employees who've exceeded their storage space allocations, and its filters enforce rules about where files can be stored.

A COMPREHENSIVE APPROACH

Companies with multi-vendor storage environments that are distributed across locations should consolidate

their storage in a networked environment to improve utilization, availability and data recovery, notes Peter Bell, chairman and CEO of StorageNetworks, based in Waltham, Mass.

Storage resource management software is only part of the solution, Bell believes. He counsels CIOs to figure out what's in their environment and then "standardize on process methodologies and implement robust software that will provide you with information about your environment and automate tasks such as provisioning, event management and troubleshooting." **SD**

COMPANY PROFILE

INCREASE UTILIZATION, AVAILABILITY AND DATA RECOVERY OF YOUR STORAGE ENVIRONMENT



As a leading provider of storage management software and services, StorageNetworks is in a unique position to help organizations extract the most value from their storage environment. StorageNetworks' combination of software and value-added services enables organizations to build an Enterprise Storage Utility — an approach to storage management that increases utilization, availability and data recovery of their storage environment.

StorageNetworks delivers a comprehensive and proven approach to storage management that includes:

ROBUST SOFTWARE: STORos™ StorageManager Software helps customers centrally monitor and manage their data storage environment, delivering advanced management capabilities, robust reporting, and high levels of automation. With STORos StorageManager companies can provide efficient management, improved interoperability, and higher levels of availability and data recovery across the entire networked storage environment — integrating SAN, NAS, Backup, and DAS.

SERVICES: StorageNetworks® services provide proven processes, standard methodologies, comprehensive tools, and effective training to meet the challenges of managing a networked storage environment. StorageNetworks family of services includes planning, design, and implementation; storage lifecycle management; and software training and installation.

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Like most large IT organizations, StorageNetworks has faced the challenges of achieving interoperability, visibility and centralized control. StorageNetworks is managing an environment that has scaled by more than 400% in the last 18 months and the company has achieved this with no increase in labor costs. The environment currently consists of:

- 10,000 assets and 1.5 PB of data under management
- 42 data centers / 14 cities across 3 continents
- 99.99%+ availability
- 99%+ backup success rate within window

With StorageNetworks' software and services, large enterprise organizations can achieve similar results.



**Peter Bell, Chairman & CEO,
StorageNetworks**

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THE COMPLETE CIO

**AN AGENDA FOR
PROFESSIONAL
AND PERSONAL
SUCCESS**

As information technology permeates all areas of the business, CIOs have found that they are expected to be much more than technology experts. They need to be leaders, motivators, communicators, educators and collaborators. They need to work within the organization's ethics, values and culture, navigate the politics, set realistic expectations. They need to establish themselves as trusted partners throughout the organization. And yes — they still need to keep current with technologies that will significantly impact the business.

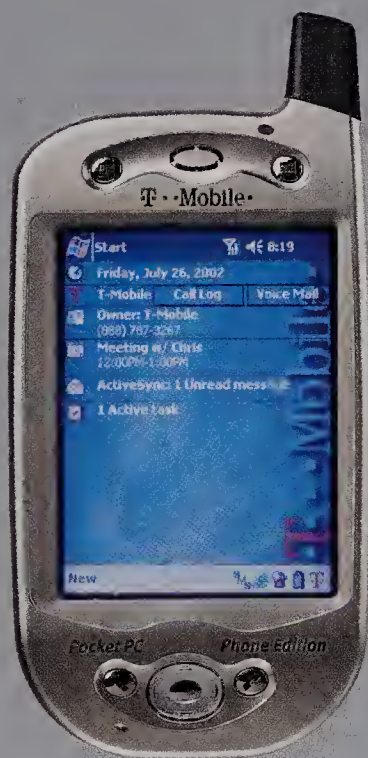
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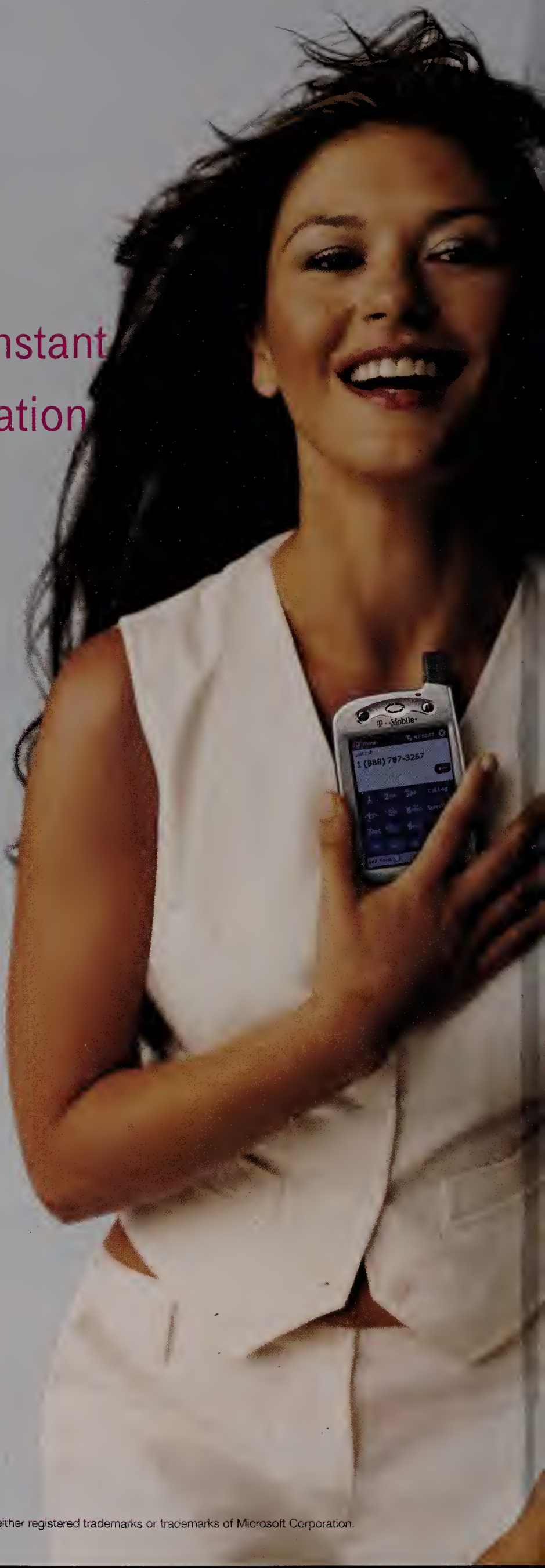
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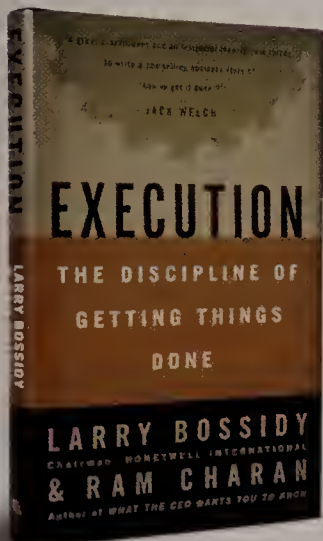
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finding the leaders within

Making sure you have the right people in the right job is more important to your company than strategic direction or decisions. Here are four fundamental aspects to building a solid people process.

BY LARRY BOSSIDY AND RAM CHARAN



If you don't get the people process right, you will never fulfill the potential of your business. The people process is more important than either the strategic planning and decision-making or operations management processes. After all, it's the people in an organization who make judgments about how markets are changing, create strategies based on those judgments and translate strategies into operational realities.

A robust people process does three things. It evaluates individuals accurately and in depth. It provides a framework for identifying and developing the different types of leadership talent the organization will need to execute its strategies down the road. It also fills the leadership pipeline that is the basis of a strong succession plan.

Very few companies accomplish all of those objectives well. One of the biggest shortcomings of the traditional people process is that it's backward-looking, focused on evaluating the jobs people are doing today. Far more important is whether the individuals can handle the jobs of tomorrow. We have seen many people who led business units well who did not have the capability to take the business to the next level. Companies often wait until the financial results are in before making corrections in key leadership positions. By then, the damage is done. The results are lagging indicators.

These kinds of decisions—putting the wrong people in place to execute a key part of a business's strategy—are common. Whether they're expanding abroad or launching a new domestic plan, far too many leaders don't ask

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the most basic questions: Who are the people who are going to execute that strategy, and can they do it? The strategy can be all right by itself, but the company may have no hope of executing it.

Identifying the match between the right person and the right job is not always a clear-cut case. Sometimes it means replacing an excellent performer with a person who is better equipped to take the business to the next level. Sometimes the problem is clear, but it should have been avoided with earlier action. A leader who achieves his numbers at the expense of the organization can do a great deal of damage. It's not hard to identify the person who is wrong for a job because of his behavior, but it's better to make sure such a person doesn't rise to a critical job in the first place.

Early feedback on behavior can have a major impact on your competitiveness. In many organizations, to create the discipline of execution, changes in behavior are needed at even the highest levels.

BUILDING BLOCK ONE: **Linking People to Strategy and Operations**

The first building block of an effective people process is a linkage to strategic milestones during the near (0-2 years), medium (2-5 years) and long terms, as well as the operating plan targets. The business leaders create this linkage by making sure they have the right kind and number of people to execute the strategy.

Consider XYZ Co., which produces components for airplane manufacturers. Its new strategy calls for providing not just products but solutions, including post-sale services that will help retain customers and create annuity income. It also proposes to win non-airline customers. The dialogue in the people process zeroes in on the shift in skill mix that will be required for the new environment for selling solutions. The company has many people who are very good at what they do, but to execute the new strategy it will need to reevaluate its leadership team and acquire fresh sales talent. Whose skills

will become obsolete? How much lead time will it take to train engineers for the new mission of solution designs, and who will be accountable?

Determining that some of an organization's high performers can't handle the challenges of a new strategic future is a difficult social process—who wants to tell good people they aren't capable of moving to the next level? It has to be done, though, and the kind of people process we are describing forces leaders to put these questions on the table. Linking people, strategy and operations also helps distill organizational challenges for the coming year.

BUILDING BLOCK TWO: **Developing the Leadership Pipeline Through Continuous Improvement, Succession Depth and Reducing Retention Risk**

Meeting medium- and long-term milestones depends on having a pipeline of promising and promotable leaders. You need to assess them today and decide what each leader needs to do to become ready to take on larger responsibilities. The dialogue resulting from this assessment will reveal the adequacy of the leadership pipeline in terms of quality and quantity. Nothing is more important to your competitive advantage.

A useful tool in developing a total picture of the pipeline is the Leadership Assessment Summary. The summary compares both performance and behavior for a group of individuals. At XYZ, for example, it shows not only which sales executives win the big contracts (performance), but it shows which ones collaborate with their peers and which are lone wolves (behavior). The Leadership Assessment Summary gives an overview of those in the group who have high potential and those who are promotable. Similarly, it shows who exceed standards in terms of performance but need improvement in behavior, as well as those who are below standard in both areas. The Leadership Assessment Summary is the end result of several key pieces of information and backup, including

Building Blocks of the People Process

A robust people process provides a powerful framework for determining the talent needs of an organization over time and for planning actions that will meet those needs. The people process is based on the following building blocks:

Linkage to the strategic plan and its milestones for the near, medium and long terms, as well as linkage to the operating plan target (including specific financial targets).

Developing the leadership pipeline through continuous improvement, succession depth and reducing retention risk.

Deciding how to handle nonperformers on staff.

Transforming the mission and operations of human resources.

the Continuous Improvement Summary, the Succession Depth Analysis and the Retention Risk Analysis.

The Continuous Improvement Summary looks much like a traditional performance appraisal. Where it differs is that it not only captures the key performance highlights, but also includes clear, specific and useful information on development needs. The Continuous Improvement Summary helps the individual become a better performer.

Analyzing succession depth and retention risk are the essence of talent planning and building a leadership pipeline of high-potential people. They are the foundation for discussing individual needs as well as lateral and upward job moves. They also focus on what needs to be done to retain critical people and replace those who leave unexpectedly, are promoted or who fail. The retention risk analysis looks at a person's marketability, potential for mobility and risk to the company if they leave.

Succession depth analysis determines

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whether the company has enough high-potential people to fill key positions. It also looks at whether there are high-potential people in the wrong jobs and whether key people will be lost if a job is not unblocked for them. The trade-offs between the need for succession depth, retention of future leaders and meeting immediate economic realities can cause a great deal of trouble if a business doesn't have a strong leadership pipeline based on good information.



BUILDING BLOCK THREE: Dealing with Nonperformers

Even the best people process doesn't always get the right people in the right jobs, and it can't make everybody into a good performer. Some managers have been promoted beyond their capabilities and need to be put in lesser jobs. Others just have to be moved out. The final test of a people process is how well it distinguishes between these two, and how well leaders handle the painful actions they have to take.

deal with them quickly and fairly.



BUILDING BLOCK FOUR: Linking HR to Business Results

If you're thinking that human resources is less important in an execution culture, let us correct that impression. It's more important than ever, but its role has to change radically. HR has to be integrated into the business processes. It has to be linked to strategy and operations. In this new role, HR becomes recruitment-oriented and a more powerful force within the organization than it was in its typical staff function.

There's no one system for creating and maintaining a robust people process, but certain rules are needed: integrity, honesty, a common approach, common language and frequency. Above all, candid dialogue is critical. It's what Duke Energy's senior vice president of human resources, Chris Rolfe, calls the "live ammo" in the people process.

Duke is a \$59.5 billion (as of the end of 2001) producer, transporter and manager of

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and talks formally about people and talent three or four times a year. Much of the work gets done in the biweekly meetings.

This is the social software that makes the system at Duke Energy work. Rolfe ticks off the four elements: "One, a culture of accountability for high performance, which makes you demand the best individuals in your organization. Two, a leader who is not only willing but also ready to question an assessment. Three, a collegial culture among the top executives of the enterprise, where they hold each other mutually accountable to be reasonable and fair and will push back on one another, just as the chairman will push back. And four, giving me, as the head of HR, the right to push too because I have a fundamentally different perspective because of the work I do. I'm not a small executive of the company. When I make an observation, everybody listens to me because it's not about rank. It's about the credibility and the perspective of the individual."

The right people are in the right jobs when information about individuals is collected constantly and leaders know the people, how they work together and whether they deliver results—or fail to. It's the consistency of practice that develops expertise in appraising and choosing the right people. The people process begins with one-on-one assessments, but when developed and practiced as a total process, it becomes effective as an execution tool. If a company has the right people, in all likelihood its strategies will be in sync with the realities of the marketplace, the economy and the competition. **CIO**

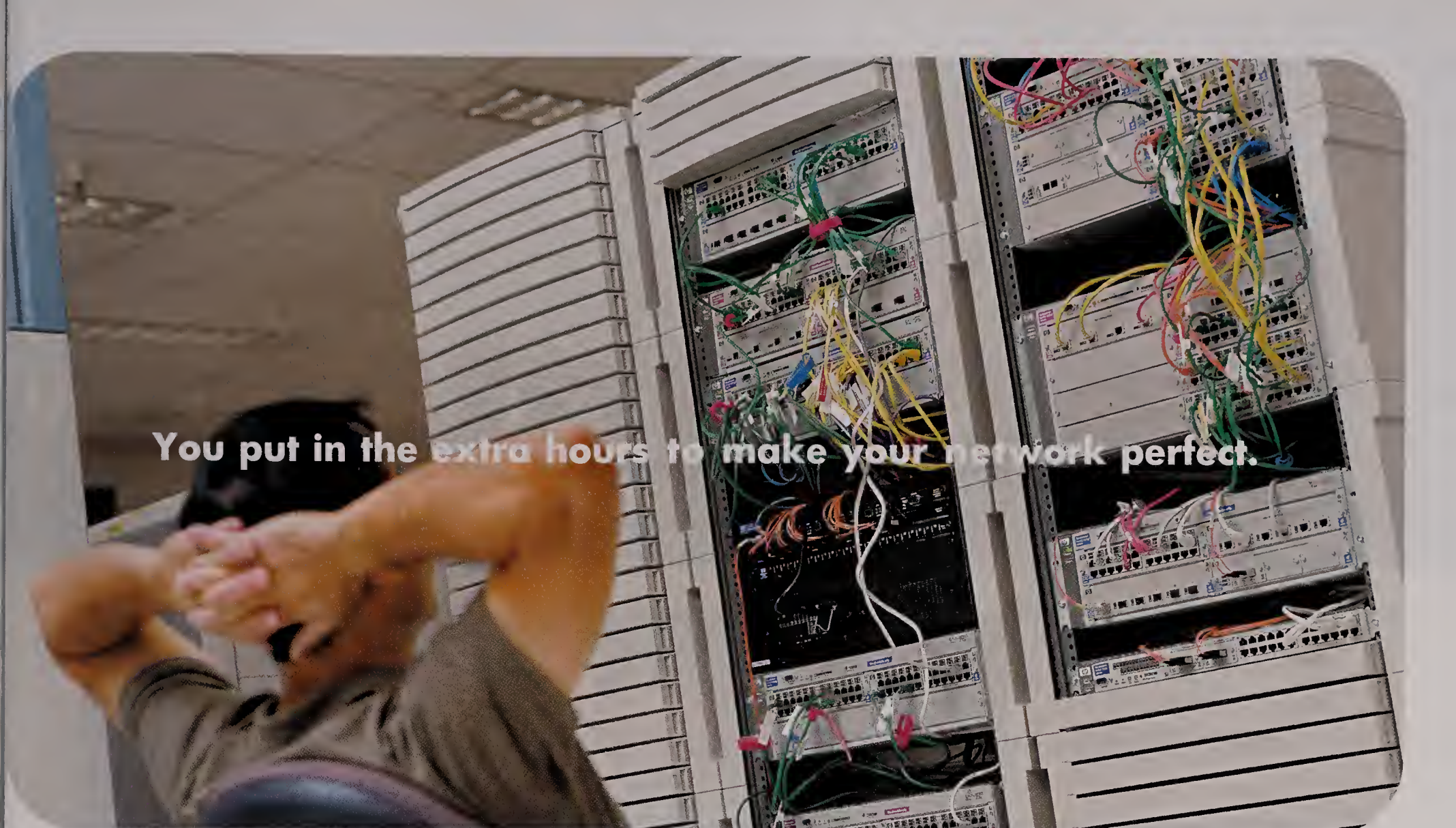
Larry Bossidy is the chairman and CEO of Honeywell International. He has also served as the chairman and CEO of Allied Signal, COO of GE Capital and vice chairman of GE. Ram Charan is an adviser and consultant to corporate executives and the author of *What the CEO Wants You to Know* and *Every Business is a Growth Business*.

There's no one SYSTEM for creating a robust people process, but certain RULES are needed: INTEGRITY, honesty, a common approach and common LANGUAGE.

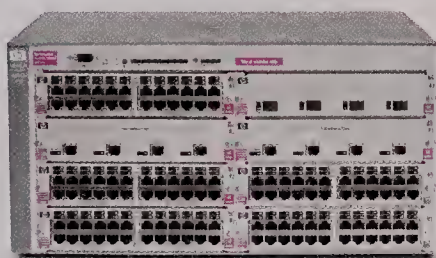
There's one thing that wakes you up in the deep of night after you make these selections. You've all discussed someone carefully, listened to all viewpoints and reached a conclusion you all feel good about. But no matter how successful a person has been so far, every promotion is a new decision. You can't take it for granted that he's going to succeed in the next job. Nonperforming people are essentially those who aren't meeting their established goals. They're unable on a regular basis to accomplish what they are responsible for. Their failures don't mean they're bad people. It just means that they aren't performing at the level that is essential for the company's success, and you must

diverse energy sources based in Charlotte, N.C. Duke had to head into a new strategic direction after deregulation of the power business in the 1990s made its old utility model obsolete. Duke developed a strategy that includes physical assets like power plants and pipelines, buying and selling natural gas and electricity, and financial operations like risk management.

The main social operating mechanism for Duke Energy is Chairman, President and CEO Rick Priory's policy committee, which consists of him, the heads of the three major business segments, and the heads of the four major staff functions—legal, finance, administration and risk. The group meets biweekly



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Wireless Wranglers

Management software promises to harness wild mobile devices—eventually

BY JOHN EDWARDS

Edited by Christopher Lindquist. Send your thoughts and ideas for future columns to clindquist@cio.com.

HIS OFFICIAL JOB TITLE is personal communications manager, but John Crouch often feels more like a professional juggler. That's because Crouch is in charge of the 500 or so Research In Motion BlackBerry handhelds used by medical

and administrative employees of Baylor Health Care System, one of the nation's largest non-profit health-care providers.

Managing wireless devices is a daunting task. Cell phones, PDAs, notebook PCs and other

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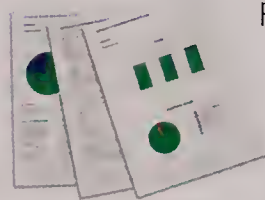
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mobile wireless gadgets are easily lost, occasionally stolen and, unlike desktop PCs and telephones, difficult to inventory. And like many other enterprises with proliferating wireless devices, Dallas-based Baylor is looking to bring order to its mobile fleet by using wireless device management software.

As companies equip more employees with wireless devices, and as the units themselves become increasingly sophisticated and expensive, the need for effective and efficient management tools grows ever

word to regain access. "There really wasn't any centralized management," he says.

After reviewing tools from several different vendors, however, Crouch settled on mFormation Enterprise Manager, developed by mFormation Technologies. If a user can't find his handheld, Crouch can send a command that immediately locks the device and prevents prying eyes from viewing any stored information. "[And] if it's confirmed stolen, we can actually wipe all the data off the device," he says.

Gartner now estimates the total cost of ownership for wireless devices at more than \$4,100 per user per year.

more pressing. (Gartner now estimates the total cost of ownership for wireless devices at more than \$4,100 per user per year.) Looking to fill the management void, an array of vendors—ranging from niche players like Mobile Automation to software giants such as Novell—is promising to help enterprises get wireless units under control.

The available software ranges from asset management tools that let administrators inventory their pricey mobile investments to applications that provide on-the-fly software upgrades, remote synchronization, security features and even the capability to locate a lost or stolen device. But no one tool as yet can do everything for everyone.

Safe and Secure

For Crouch, the device management capability that matters most is security administration. Since Baylor employees routinely access sensitive patient information on their BlackBerrys, it's important that administrators can swiftly secure data in the event a unit is lost or stolen.

Until last year, Crouch's sole line of defense was a simple software utility that locked each handheld after 60 minutes of idle time; the user then had to enter her pass-

Beyond safeguarding critical data, the mFormation software also helps Crouch find lost units. The technology isn't accurate enough to tell Crouch on exactly which restaurant table or under which car seat an errant BlackBerry has been left, but narrowing down the AWOL handheld's location to the nearest cell tower can jog the user's memory. "We've located several devices with that mechanism," says Crouch. Down the road, as more wireless devices begin incorporating GPS technology, management software will gain greater location accuracy.

Software Distribution

Another way wireless management software can help administrators is by delivering software upgrades and enhancements—including critical virus antidotes—to wireless devices. The diffused nature of over-the-air networks makes wireless software delivery an imperative for organizations that must juggle large numbers of devices. "It's either very difficult or very expensive for central IT managers to physically touch each device to keep it properly maintained and updated," says Warren Wilson, an analyst who follows mobile device management products for Summit Strategies, a Boston-based technology research company.

Several software vendors, including Mobile Automation, Novell (which acquired Callisto Software, a wireless device management software startup, last year) and XcelleNet, supply products that allow administrators to automatically distribute software to wireless devices. The tools typically allow administrators to deploy software as if the wireless devices were all linked to a traditional cable-based network.

Many products that allow wireless software distribution also support remote synchronization. That capability gives wireless device users—primarily PDA and laptop PC operators—access to their desktop PC information without having to return to the office and plop the device into a cradle.

Asset Management

Wireless device administrators also need to keep tabs on their mobile investments. Wireless asset management tools, supplied by companies like mFormation and Novell, let administrators know exactly how many devices they have in the field at any given moment, the types of devices being used and each unit's precise configuration.

Management software helps organizations reduce the number of devices lost through theft or negligence, says Nancy Braatz, a senior technology analyst with the Waukesha Engine Division of Dresser Industries, an industrial engine manufacturer in Waukesha, Wis. "We're able to track who's got which device, what serial number, etc.," she says. "If you're going to implement anything more than 10 units, or any users who are not all in the same building, I would recommend doing this."

Having fast and easy access to device type and configuration information is vital to efficient wireless software distribution. "You can't deploy an application that needs 2MB of RAM on a device that has only 1MB available," observes Sum-

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mit's Wilson. Knowing which applications are running on specific devices is also essential to meeting the requirements of software licensing agreements and for troubleshooting problems.

The wireless asset management field is expanding rapidly. The market's startup pioneers are being joined by a growing number of traditional network management software vendors, such as Computer Associates International and IBM Tivoli, that are adding wireless management capabilities to their existing network management product lines.

Multiple Choices

Given the wide range of mobile device management tools offering a patchwork of features and device compatibility, finding the right product isn't easy. Baylor's Crouch suggests that wireless administrators prioritize their management needs and then select the software that most closely matches their requirements. "Just make sure you do your research and get what you're expecting to get," he says.

The situation is particularly chaotic for

the only solution may be to acquire two or more management products.

Management software pricing varies widely. The mFormation Enterprise Manager, for example, costs \$20,000 for the server software and between \$55 and \$75 per device. The software is also available as a hosted service ranging from \$5 to \$10 per device per month. Novell's ZenWorks for Handhelds, on the other hand, is priced at a flat \$59 per device.

Many wireless device administrators have responded to the confusion by sitting out this dance and waiting for the music to change. Truncated feature sets and compatibility shortfalls, as well as concerns about products keeping pace with wireless evolution, are deterring many enterprises from implementing any wireless management software. Ronni Colville, a wireless networking analyst at Gartner, predicts that software vendors will have a tough time attracting customers in sizeable numbers. "I would be surprised if these little devices are managed centrally even in three years," she says. "I think it will be a slow evolution."

Yet another factor wireless device man-

Having fast and easy access to device type and configuration information is vital to efficient wireless software distribution.

administrators who find themselves managing a mélange of cell phones, PDAs, laptops and other wireless units. For those managers, following Crouch's advice isn't that easy. Novell's ZenWorks for Handhelds, for example, provides a wide range of management features, but it works only with Palm OS, Windows CE and Pocket PC systems. (BlackBerry support, they say, is in the works.) On the other hand, mFormation Enterprise Manager supports an extensive variety of PDAs and mobile phones, and an array of wireless networking technologies, but it doesn't allow software distribution. For many enterprises,

agement software adopters must consider is exactly how they will acquire the technology. Most such products come as licensed software. But as the need for comprehensive device management grows, wireless service providers, sniffing a revenue opportunity, have started offering management tools as add-ons to their service packages. Crouch, for example, licenses mFormation Enterprise Manager from service provider GoAmerica. He notes that the add-on approach has allowed Baylor to sidestep the cost and inconvenience of installing the application on its own servers. "Everything has worked as promised, and it's been a

Cool Product

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SECURING PDAs remains a oft-overlooked chore for many IT departments. Now Pointsec Mobile Technologies thinks it has a tool to make administration easier.

Pointsec for Pocket PC and Pointsec for Palm OS both offer encrypted, separate storage areas for sensitive information that needs a higher level of security. Users can also enter their PIN codes either with a standard number keypad or a "picture" pad that lets them choose a series of small icons as their code. The icons can also be randomized to help prevent theft by onlookers.

The software also includes features designed specifically for IT departments looking to get a better handle on PDA security. The Pointsec products let administrators set security policies—such as the number of times an incorrect password can be entered before the system locks itself and whether the infrared "beaming" feature is on or off—from one location. Accidentally locked-out users can also call IT for a code that will let them regain access to their device.

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—Christopher Lindquist

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very smooth rollout," says Crouch.

On the other hand, in return for the cost savings and convenience, add-on customers must be willing to give up control over the technology, including the ability to customize the software.

The Future: SyncML

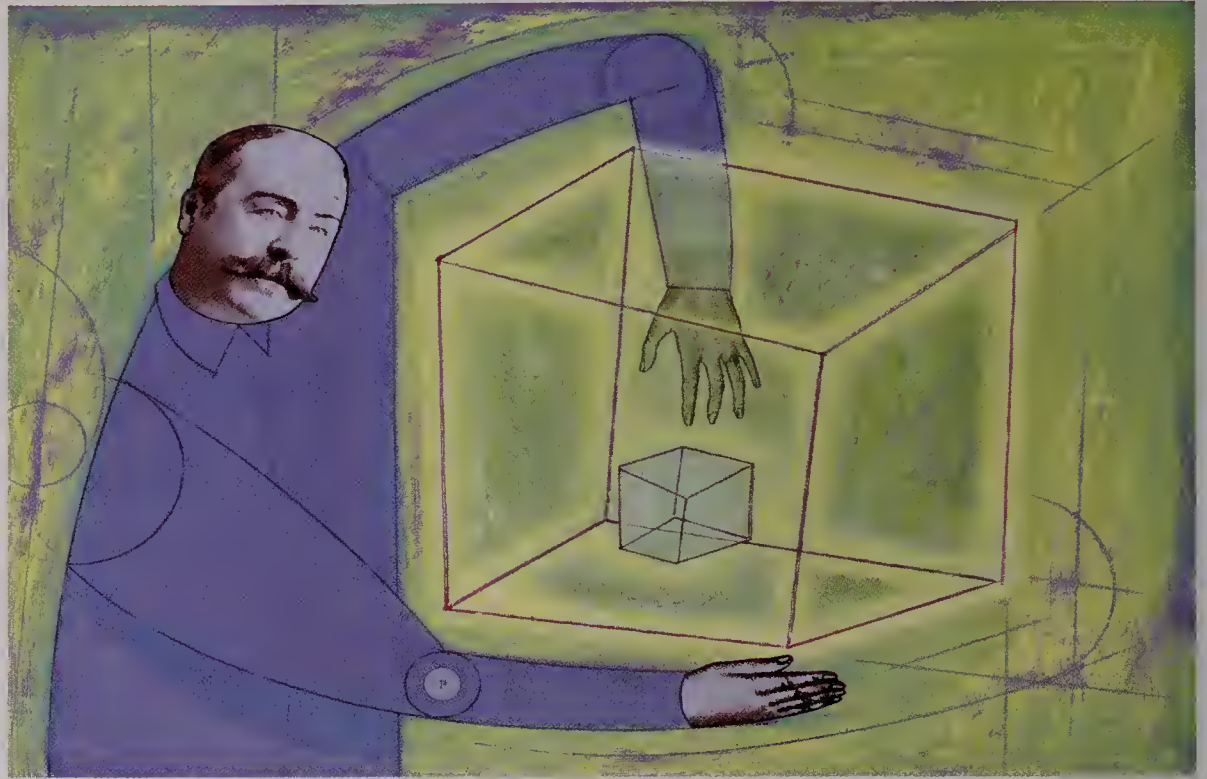
Promising to make wireless device management less painful in the future is SyncML, a mobile-oriented data exchange language backed by Ericsson, IBM, Motorola, Nokia and other major wireless players. Based on XML, SyncML aims to pave the way toward the synchronization of all devices and applications over any wireless network.

With SyncML, any personal information, such as e-mail, calendars, to-do lists, contact information and other relevant data, will be consistent, accessible and up to date, no matter where the information is stored. For example, a calendar entry made to a mobile device on a business trip would be equally available to colleagues accessing a network calendar on other mobile and stationary devices.

Although SyncML looks like a step in the right direction toward improved wireless data compatibility, the technology isn't likely to solve the most pressing wireless device management concerns, such as asset management, security and software distribution. "SyncML is mostly about making sure you get your new e-mail and that the inbox on your handheld device looks like the inbox on your desktop computer," says Summit's Wilson.

In fact, wireless device management is likely to get more challenging before it gets easier. With hardware developers constantly dreaming up new wireless products, administrators are likely to find themselves in a tail-chasing race to get a handle on device management. "Think about PCs," says Gartner's Colville. "They came out in 1981, and we're still trying to manage those darn things." ■

E-mail John Edwards, a freelance writer based in Gilbert, Ariz., at john@john-edwards.com.



UNDER DEVELOPMENT

3-D displays

The Holographic Story

IN A FAMOUS SCENE from the original *Star Wars*, R2-D2 and Chewbacca play a game of chess on a board where 3-D pieces battle. Twenty-five years after the movie, holographic virtual displays capable of similar effects may be just around the corner.

Resembling a psychic's crystal ball or one of those "lightning in a globe" toys, the Actuality Systems' Perspecta Spatial 3-D Platform may be both prophetic and electric. The Burlington, Mass.-based company began as an entry by Actuality founder and CTO Gregg Favalora in the MIT \$50K Entrepreneurship Competition (it was a \$10K winner). The current version consists of a 10-inch spherical display and a software environment that lets standard PCs take advantage of holographic imaging (the system supports the OpenGL graphics standard as well as a proprietary application program interface).

The display has already piqued the interest of the military for its obvious tactical applications, but Favalora says that Perspecta could support a variety of uses. Doctors could view CAT scans in full 3-D rather than relying on slices or "virtual 3-D" rotations on a flat screen. Manufacturers could create and demonstrate virtual prototypes of products. Drug manufacturers could visually explore proteins while looking for disease treatments. And, of course, computer game players would love it.

Unfortunately for gamers, the Perspecta Platform is still in its early stages and requires a number of improvements before it could become a widespread product—with reduced pricing being near the top of that list. The current iteration runs at about \$50,000 for one display and software, though Favalora says that efficiencies of scale and Moore's Law could work to quickly reduce that price.

Technological advances will help too. Today's Perspecta supports only hundreds of simultaneous colors (typical PC monitors support thousands). The display could also be brighter—Favalora admits that the current model works best in a dimly lit room. But, he notes, the second generation of the display is nearly complete and will begin to resolve some of those issues.

—Christopher Lindquist



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COMPANY TO WATCH

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Getting a Witness

Witness Systems helps companies build quality call centers

BY SUSANNAH PATTON

WE'VE ALL HEARD the recording: "This call may be monitored for quality-assurance purposes." But just who is listening to those calls? In the past, call center supervisors plugged tape recorders into phones or strolled the aisles to overhear agents talking to customers.

Now, companies with call centers can take a more automated approach to quality assurance, using software to randomly record and evaluate agent-customer interactions by phone, e-mail or on the Web. Witness Systems of Roswell, Ga., which introduced the concept of synchronized voice and data recording in the early 1990s, claims that it has about 80 percent of the quality monitoring and assurance market and is equipped to help any company with customer service concerns.

The company's eQuality suite can help users evaluate their customer contacts, analyze agent performance and train customer service representatives. The software suite allows companies to record phone calls but also capture screen interactions including e-mail, instant messaging and Web chat. Analysis tools evaluate performance and allow the company's products to integrate with third-party information such as human resources software. Another application offers training to call center reps whenever it identifies a gap in technology or skills.

"If a marketing campaign doesn't have a close rate of 11 percent, I want to notify the senior VP of marketing and send 15 examples of calls," says Witness Systems President and CEO Dave Gould. "We provide tools to help you evaluate how interactions take place—like a coach would use game films."

Witness Systems Inc.

Headquarters Roswell, Ga.

Founded 1988

Employees 350

Sales \$62 million in revenue for 2001 fiscal year

Products eQuality software suite

Reason to watch Continues to maintain a large percentage of market for quality-assurance monitoring through phone, e-mail and Web

Hurdles Must make technology transition as call centers switch to new technologies such as VoIP

Website www.witness.com

Car manufacturer Saturn of Detroit used to hand out tape recorders to the supervisors at its customer assistance center, which it runs in partnership with technology services company EDS. Those supervisors would then take notes on the customer service conversations that they heard. Since installing Witness Systems software in 1997, Saturn says supervisors' workloads have been cut by 50 percent. "Before we started working with Witness Systems, we weren't monitoring calls in a truly random manner," says Steve Fort, account manager for EDS at the Saturn customer assistance center. "Our theory is if a machine or software can make it happen, let's make it happen."

Lisa Hager-Duncan, an analyst with Gartner, says that Witness Systems' strength lies in its full understanding of the needs of agents and management in the call center. "Witness does the quality piece extremely well," says Hager-Duncan. "They give real-life examples of what customers are saying,

and [Witness's] marketing message is starting to get out there."

But Hager-Duncan also notes that the space is very competitive at the moment, with some vendors offering—in addition to quality assurance—logging services for 911 centers, air traffic control centers and other locations that are required by law to record conversations. "If a company wants both logging and quality assurance, then Witness Systems may have a harder time," she adds.

In order to gain a competitive edge, Witness Systems had formed a partnership with one of its customers, Minacs Worldwide of Toronto, to offer professional services in the call center arena. Minacs, which runs call centers for major corporations in the manufacturing and financial services sectors, among others, chose the eQuality software after a cost-benefit analysis rated Witness Systems above some competitors, says Eric Greenwood, Minacs' senior vice president and CIO of the professional services organization. Greenwood also says that Witness Systems had good compression ratios, meaning it uses less disk space than some competitors.

In the future, however, Witness Systems and others providing quality-assurance monitoring will have to adapt their products to support voice over IP (VoIP), Greenwood says. VoIP call centers use information packets routed over the Internet rather than the phone network to carry communications—generally from less-expensive-to-operate overseas call centers to North America.

Kevin Hegebarth, director of strategic planning at Witness Systems, acknowledges the company has spent the past year working on ways to connect to Internet protocol call centers. "A year ago, VoIP was a huge obstacle to overcome," he says. "Now we're ready to integrate." ■

Do you know of a company that other IT executives should hear about? Submit it to Technology Editor Christopher Lindquist at clindquist@cio.com.

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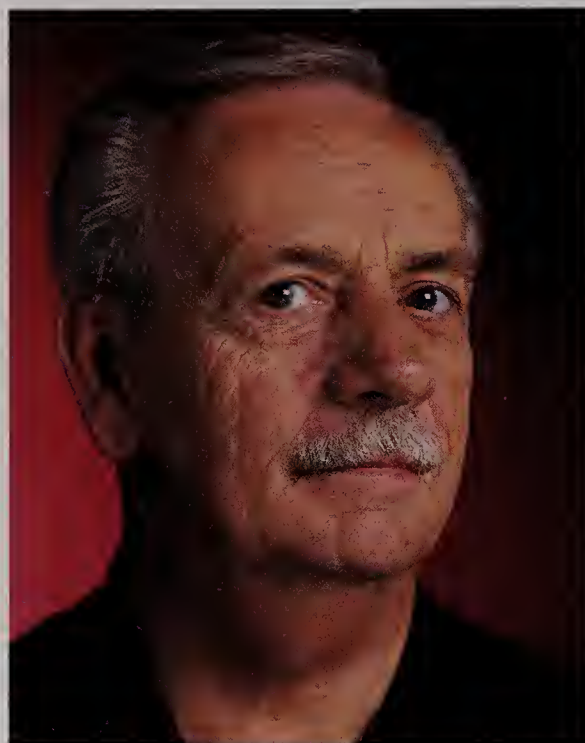
There may be lots of glass under the streets—but a lot may not really be enough **BY BUD BATES**

I CONTINUALLY HEAR firmly stated opinions from various industry gurus and the stock pickers at investment houses that there is an overabundance of fiber-optic cable currently installed across the United States.

Now, most doctors would agree that we all need more fiber in our everyday diet, but we need only one small strand of optical fiber to the door of our office or home. If we really have a so-called glut, then why don't we—as potential customers for fiber-based communications services—see it yet? Why are we still doing everything over copper? The answer: Because there really isn't a glut.

Here's the situation. A couple of years ago telecommunications carriers were installing extra fiber along all of their routes. Local telephone companies installed extra strands in metropolitan areas as a hedge against future shortages. Long-distance companies tried to prepare for the much-anticipated Internet explosion. And third-party companies wanted to make sure that they had sufficient fiber in the ground to sell to the other players. Backhoe time is expensive, and installing extra fibers during each dig could delay the need to visit city hall to request new permits to plow up the streets—again. (It can cost \$250,000 to \$1 million per mile to trench, lay conduit and pull fibers along many of the heavily trafficked routes.)

That is exactly what many of the companies did, and now they are being chastised for their foresight. And if you look at the installed base of fiber between most of the major communications routes in this country, you'll find that the existing fiber is mostly lit (industry jargon for



Changes in technology, such as innovations in lasers, have leapt beyond the capabilities of some currently installed fibers.

—Bud Bates

operating), and observers say that we'll likely run out of capacity in the next 12 to 18 months.

But there's another interesting fact to consider. Much of the unlit, or "dark fiber," out there (and some of it does exist) may already be obsolete. Changes in technol-

ogy, such as innovations in lasers, have leapt beyond the capabilities of some currently installed fibers. Can we really claim to have excessive fiber if the spares lying underground cannot be lit with the latest technologies?

Someday, when the economy bounces back and the Internet becomes what it is truly intended to be—a media-rich, converged network that offers streaming and real-time protocols with high quality and rapid delivery—the demand for fiber capacity will explode once again. At that point, the few fibers left unlit—at least those that will still work with current hardware—will become vital in sustaining the next wave of growth.

Additionally, the use of on-demand bandwidth in the form of "designer wavelengths" has to mature and become commercially available for the carriers to uphold the technology's promise. Without a doubt, this new offering of designer bandwidth will consume whatever fiber we still have held in reserve.

The real problem is not whether we have the capacity necessary for the far future—we don't. So we need to stop talking about fiber gluts and move on. The real questions are: How do we deliver current and future fiber to the door, and What do we charge for it?

Customers want bandwidth that is better, faster and cheaper. When the carriers finally deliver that bandwidth and the necessary equipment becomes affordable, then the rate of consumption will result in not a glut but a shortage.

So let's stop criticizing the carriers for their fiber-burying enthusiasm. They were merely guilty of looking ahead with some optimism. And fiber's time will arrive. Let's just keep our fingers crossed that the fibers under our feet will be useable when we need them. **CIO**

Bud Bates is president of TCIC in Phoenix and author of books on wireless broadband telecommunications and GPRS. He can be reached at bud@tcic.com.

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Net Gains

Creating Value Online

Fields of Online Dreams

E-commerce can flourish anywhere if you build the right business model

BY MOHANBIR SAWHNEY

WE NATURALLY ASSUME that industrial enterprises are the most fertile grounds for e-business implementation. And we assume that conducting e-business requires communications infrastructure and a minimum level of computer literacy. On a recent trip to India, I discovered how wrong those assumptions are. A quiet digital revolution is reshaping the lives of farmers in remote Indian villages.

In these villages, farmers grow soybeans, wheat and coffee in small plots of land, as they have for thousands of years. A typical village has no reliable electricity and antiquated telephone lines. The farmers are largely illiterate and have never seen a computer. But farmers in these villages are conducting e-business through an initiative called e-choupal, created by ITC, one of India's largest consumer product and agribusiness companies.

Think of an e-choupal as an Internet kiosk, village gathering place and e-commerce hub all rolled into one. In fact, the word *choupal* means "village gathering place" in Hindi. The e-choupals are run by an operator called the *sanchalak*, who is himself a farmer recruited by ITC to be the interface between the computer terminal and the farmers.



Low Tech, High Impact

Setting up and managing these e-choupals required ITC to think out of the box. It designed a hardware solution that includes a desktop computer with power backup through batteries charged with solar panels. ITC also convinced 175 local telephone exchanges to upgrade their equipment to support data transmissions, initially at ITC's expense. To overcome limited bandwidth, they cached static content locally so that only dynamic content needed to be streamed. And to overcome illiteracy, ITC made the transactional capabilities of the site available to farmers through the registered sanchalaks.

The results to date are impressive. Within two years of its launch in June 2000, e-choupal services reach 600,000 farmers in 6,000 villages through 1,000 kiosks. ITC, which exports \$140 million worth of agricultural commodities, sourced \$15 million worth of soybeans from e-choupals in the past

ILLUSTRATION BY JESSICA ALLEN

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year. By purchasing directly from farmers, ITC can source better quality produce that commands high prices in the international market. By avoiding intermediaries for conducting the transactions, ITC saves \$5 per ton on soybean procurement. The sanchalaks get a commission for every transaction they process, which translates into healthy earnings for them.

The farmers gain from better prices and lower transaction costs. Traditionally, farmers had to wait as long as two days to dispose of their produce at local auctions. They also had to pay for bagging, loading and unloading their produce in the local market. In the e-choupal system, farmers take only a sample of their produce to a local kiosk and receive a spot quote

collection system with unparalleled reach into rural India. It also has strong relationships with farmers and intermediaries in the agricultural supply chain. These assets and relationships allowed ITC to create a unique and defensible online franchise.

■ **Define a clear value proposition for everyone.** The e-choupal venture benefits ITC by reducing procurement costs, improving quality of produce procured and creating a lucrative information franchise. For farmers, it reduces transaction costs, gets them better prices and empowers them with information. And the sanchalaks get the opportunity to run their own business.

■ **Adapt solutions to the business context.** ITC creatively overcame the lack of computing and communications infrastructure by creating appropriate technology solutions, including a human interface to overcome literacy and Internet access limitations.

■ **Reintermediate, don't disintermediate.** Instead of eliminating the middlemen, ITC redefined their role by decoupling information flows from physical flows in

the supply chain. In this way, ITC mitigated any channel conflict.

■ **Co-opt customers in designing solutions.** ITC recognized that getting farmers to adopt technology would pose a huge challenge. By recruiting the sanchalaks from within the villages, ITC was able to get buy-in from the farmers. ITC also made the sanchalaks take a public oath of office, recognizing that a social contract was far more effective than a formal contract.

■ **Think big, but start small.** ITC's long-term vision for e-choupal is grand. But the company started with a modest and focused value proposition—helping farmers get better prices for their crops. This phased approach allows ITC to gain credibility through early successes and to learn from its mistakes.

Clearly, the e-choupal initiative is a long way from becoming e-business nirvana for rural India. Telecommunications infrastructure costs are significant, adoption is slow, the network is unreliable, and the sanchalaks have limited experience managing a business. There is no guarantee that ITC will achieve its ambitious goal of expanding the e-choupal network to cover 100,000 villages and 10 million farmers in five years. Nevertheless, what it has achieved so far paints a tantalizing picture of the possibilities of e-business for rural India. And it offers valuable insights into using creativity and pragmatism to overcome barriers in implementing e-business solutions. **CIO**

ITC overcame the lack of computing and communications infrastructure by creating a human interface to overcome literacy limitations.

from the sanchalak. If the farmers accept the quote, they can drive their produce directly to ITC's collection centers and get paid within a couple of hours. The average farmer saves between \$8 and \$10 per ton of soybeans. Farmers also benefit from improved information and price discovery. With help from their sanchalak, they can access real-time information on crop prices, weather and scientific farming practices online.

ITC's long-term plan is to evolve the e-choupal into a one-stop shop for farmers to take care of many different business needs. S. Sivakumar, CEO of ITC's international business division, told me his company modeled the e-choupal on a concept I originated, which I called a metamarket. Ultimately, ITC envisions the e-choupal as an e-commerce hub for the village—a single point of contact among farmers and a wide range of suppliers of agricultural inputs and consumer products. Already, seed producers such as Monsanto and fertilizer manufacturers like Nagarjuna Fertilizers and Chemicals take orders and market their products through the e-choupal sites. Future plans include services like small business loans and insurance.

Meanwhile, ITC has maintained a role for the traditional commission brokers, who are now called *samayojaks* ("coordinators"). The samayojaks manage physical flows in the supply chain, such as logistics, and they collect pricing data from local auctions and maintain records.

Back to Basic Best Practices

The e-choupal initiative offers the following important lessons for any e-business initiative.

■ **Leverage existing assets and relationships.** ITC's tobacco and agribusiness divisions own a distribution and

Can you think of any unusual e-business applications? Write to netgains@cio.com. Mohanbir Sawhney is the McCormick Tribune Professor of Technology at Northwestern University's Kellogg School of Management. You can reach him via e-mail at mohans@kellogg.northwestern.edu.





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Reality Bytes

A Cold Look at Hot Trends

Fed Up with Feedback

New software promises to automate performance evaluation. Call it robo-review. Whatever you call it, we don't like it.

BY ALISON BASS

AMERICANS HAVE LONG BEEN SUSPICIOUS of the idea of a national ID card, particularly one linked to a centralized database kept by the federal government. Even after Sept. 11, a majority of Americans (according to various polls) oppose Oracle founder Larry Ellison's concept of a national ID card embedded with biometrics. We-the-people seem to get the Big Brother ramifications of technologies that permit the instantaneous collection and analysis of reams of data. But there's another side to this stuff that gets less attention but is just as insidious.

Take, for example, a new software release that purports to collect and collate data on an employee's performance and deliver it to that person on a "continuous and timely" basis. This software, called individual performance improvement (IPI), has been developed by the folks at Richmond Hill, Ontario-based Changepoint.

According to a Changepoint press release, IPI software takes feedback from the employee's peers or customers and combines it with existing data from the RoboBoss system for a "holistic picture." What's so bad about that, you ask? After all, an increasing number of employers collect feedback from



people at all levels of an organization for what is known as a 360-degree review of an employee's performance. This type of evaluation is widely considered state of the art. But the raw data for these evaluations are not stored in some centralized database as part of the employee's permanent record.

IPI would change all that. It would provide a permanent audit trail of all kinds of feedback, some of which you and I might view as prejudiced or trivial. The danger of such a permanent record is its power to pigeonhole people—freeze them in a snapshot of time that could rob them of any potential for future change. Keep in mind that what is now stored in an employee's permanent file is the final review, carefully crafted by a (one hopes sensitive) manager who has pulled together the highlights of that person's performance. IPI software would automatically add to that all the off-the-cuff commentary that anybody has ever made. People are already afraid to discuss

ILLUSTRATION BY ALEX NABAUM



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performance (because of fears about legal liability, some employers won't even give you a job reference once you've left their employ). So you can imagine how much more timid this will make corporate employees. Or dare I say, robotic?

Save the Children

This kind of permanent audit trail could pose even greater harm in other arenas. Consider a similar software app that is now being marketed as a student assessment tool for K-12. Created by Data Friendly, this software can analyze thousands of student records to help teachers and administrators better assess factors affecting student performance. For instance, such aggregate data might help a teacher understand why the dropout rate in her eighth-grade class is so high, according to Ronald Daniels, the CEO of Data Friendly in Bala Cynwyd, Pa. That kind of tool could indeed be valuable in analyzing aggregate trends in student performance. The slippery slope comes in its capacity to collect and analyze an individual student's information (including what

Software that constantly monitors employee performance would seem to be just the kind of tool that HR departments love. (No companies are using IPI yet, but a Changepoint spokeswoman says many customers have expressed interest.)

What's most pernicious (to me at least) about this software is that it "provides employees with continuous and timely feedback on all areas of their performance," according to Changepoint. "All areas" takes in a lot of ground, doesn't it? Imagine that you're sitting at your computer, writing up a report, and flashing on your screen is the latest feedback from your peers: "Bass, you were a little too grumpy at today's project meeting."

I can't imagine a feature more destined to dampen productivity and ruin morale. But don't take my word for it. Several consultants who specialize in employee performance believe this kind of software might be counterproductive. "It's the word *constant* I have trouble with," says Fred Reichheld, a Bain fellow and author of *Loyalty Rules*. "Any feedback that goes beyond monthly wouldn't be valuable. At that point,

you're running a popularity contest and making employees constantly worried about messing up their performance."

Indeed, software that is perceived by employees as being a control and audit mechanism often produces an oppositional effect, says Alan Wolfson, senior consultant at Hay Insight, a division of

Philadelphia-based Hay Group. "Employees end up seeing this kind of system as a nuisance rather than a performance aid, and they stop using it," he says. And then you've spent all that money for, essentially, bubkis.

There is, of course, value to some kind of automated system that provides timely feedback to managers, particularly those who are monitoring an offsite project being performed, for instance, on a consulting basis. Say, for example, you're a manager at Accenture and you have assigned someone to work on a client's database. A week later, you might send this automated survey to the client to see how things are going. And you get back data that indicates the employee is absolutely the wrong person to do this particular job. "This would allow the manager to clear up the situation so it doesn't fester and become a problem down the line," explains Kazim Isfahani, principal analyst for the Robert Frances Group in Westport, Conn., and a proponent of the new ISI software.

That's perfectly true. But why couldn't the manager just pick up the phone or send an e-mail to the client to ask how the job was going? It strikes me that the latter would not only be more client-friendly, it would be a whole lot cheaper too. **CIO**

Senior Editor Alison Bass will not be grumpy if you disagree with her. You can do so at abass@cio.com.

Imagine you're sitting at your computer, writing up a report, and flashing on your screen is the latest feedback from your peers.

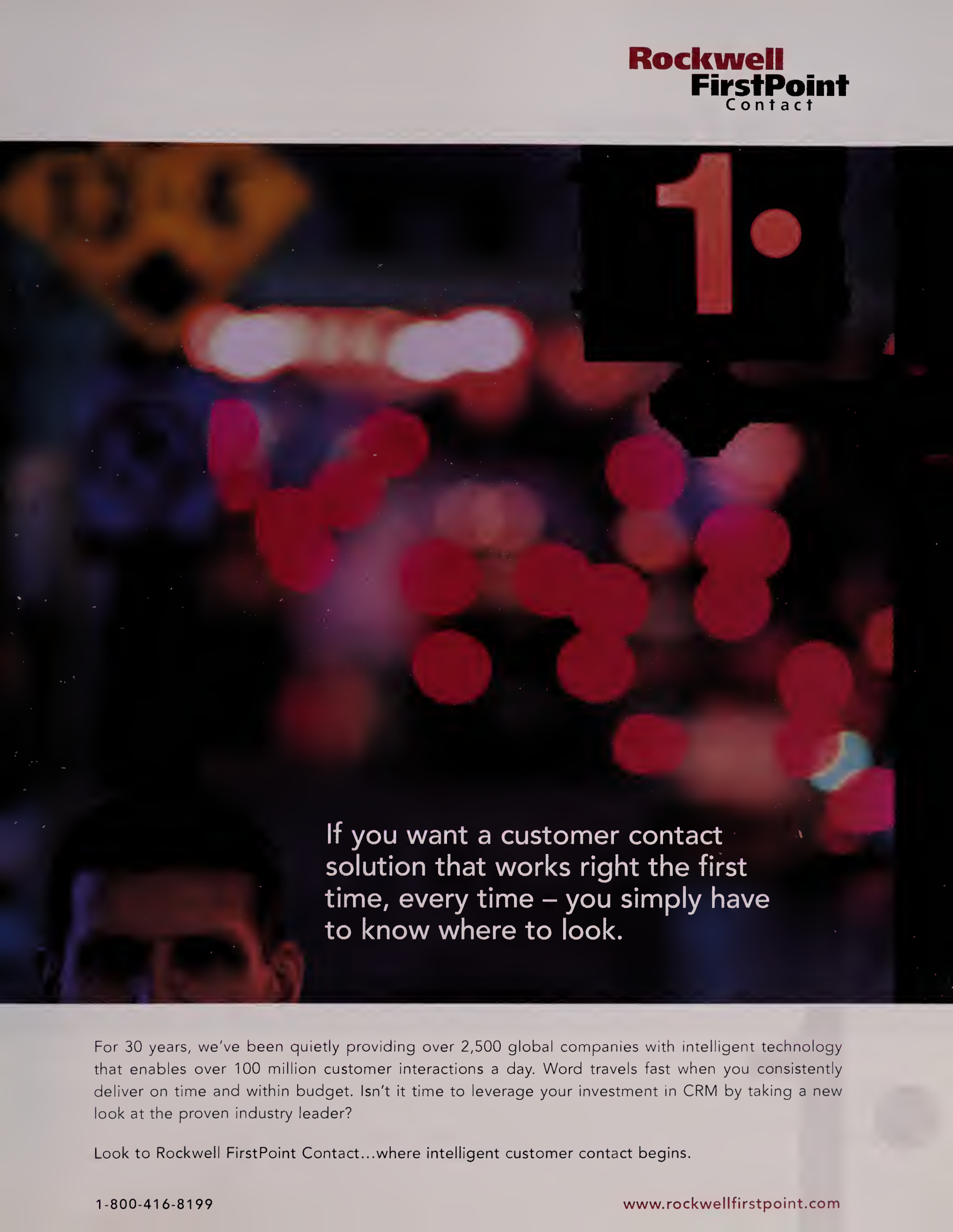
she eats for lunch and what she's told her guidance counselor about problems at home) in order to assess her progress and identify her strengths and weaknesses. Too many public school students are already stereotyped as slow learners or problem children based on irresponsible teacher analyses. One can imagine the potential for injury, not to mention massive invasions of privacy, if software like this were ever to be used on a large-scale basis in our school systems to track individual students.

In my son's school, for example, there is a child with behavioral problems. His teacher and principal, along with a few parents, know that his father is in prison and his mother is a drunk. School officials are sensitive to this boy's needs, which seem all the more glaring because he lives in an affluent suburb. But what would happen if all this information were automatically stored as part of his permanent record? Might a college recruiter wonder about the wisdom of recommending a student with so dysfunctional a family history?

So far, Data Friendly has not made major inroads into the public school system. And that's because, as Daniels himself acknowledges, many educators are leery of the software.

Why This Won't Work

One can only hope that corporate HR departments turn out to be similarly discriminating. Alas, that may be overly optimistic.



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From the Publisher

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Shell-Shocked?

THE INTERNET CRAZE. The Internet bust. The slowing economy. A new administration in the White House. September 11th. The Enron, Tyco and WorldCom fiascos. And as we go to press, the threat of a war with Iraq.

Are you feeling shell-shocked? John Gantz, chief research officer of IDC, thinks you are. (IDC is a sister company to CIO's publisher.)

Gantz offers a story told to him by noted economist Lester Thurow. It goes like this: A coyote is chasing a jackrabbit. The rabbit outruns the coyote and jumps in his burrow, scared to death. The coyote lurks outside the hole for about 30 seconds and then heads off in search of other prey. But the rabbit, fearful the coyote is still there, stays in the burrow for a week.

According to Gantz, too many CIOs are acting like the frightened jackrabbit. Yes, it has been a wrenching two years to be a CIO, with lots of coyotes circling. But one thing all downturns share is this: They are always followed by an upside. Need proof? IDC predicts that the global IT market will grow by 9 percent in 2003 taking it to \$1 trillion for the first time in our industry's history.

Think about that for a moment. Our collective industry is on the doorstep of a historic level never seen before. Sure doesn't feel like it, does it?



Gary J. Beach

IDC's numbers are born out by the monthly results of the CIO magazine Tech Poll. Since August 2000, the Tech Poll has gauged the 12-month forward-planned spending increases of CIOs. In August 2000, CIOs pegged future growth at slightly over 18 percent; 26 months later it is about 5 percent.

OK, that's a steep drop-off, but the key thing is that IT budgets—at least from reviewing thousands of interviews collected in the Tech Poll—are still growing. The pain users and vendors felt was the pain of being caught in budgets built on double-digit growth.

With 60 percent or more of your budget in fixed costs, such as salaries, a 5 percent increase is a misnomer. Budgets have to increase at least 3 percent to 5 percent on top of that 5 percent to get things jump-started again. And they will. It's just a matter of time. When, you ask? Most point to improvement in corporate profits. Others, and I am in this camp, look to lower unemployment rates as the lever to ignite the next wave of IT spending.

Many readers will be finalizing 2003 IT budgets in several weeks. Is John Gantz right—are you a shell-shocked CIO? Or do you plan to come out of your burrow to address your growing application backlog? Drop me a note at *gbeach@cio.com*.

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FALL 2002

THE GLOBAL TECHNOLOGY MARKETPLACE

EXECUTIVE

Summaries

OCTOBER 15, 2002

COVER STORY | Secondary Market Hardware

By Scott Berinato | 52

In the wake of the 1990s technology bubble, there is so much used hardware available—and so much emphasis on cutting costs—that secondary market hardware is now a mainstream business. And once buyers get used to wholesale prices, it's unlikely that they'll go back to buying retail. CIO's survey of 187 IT executives showed that 77 percent are purchasing secondary market equipment and 46 percent expect to increase their spending on used machines next year. The savings from buying used can amount to 25 percent of operational costs, as it did for Tenneco Automotive. Meanwhile, some hardware vendors are trying to make purchasing on the secondary market sound as unappetizing as possible, implying that the cheap equipment comes from the semi-illegal "gray market." They tell buyers it will cost thousands to recertify the boxes. And they threaten to withhold support. CIOs who call these bluffs will find that the sales reps will either start trying to sell support services or they'll cut the price of their new gear. Buyers also gain leverage from the emergence of third-party companies offering alternative maintenance contracts.

"You'll save money just by entertaining me. Tell a vendor you're looking at used gear, and they'll start cutting their prices immediately. You're foolish not to at least inquire."

—RICHARD HART, OWNER OF
USED HARDWARE VENDOR
H AND H TECHNOLOGIES

Security Incident Reporting

By Sarah D. Scalet | 62

THE PRIVATE SECTOR still hasn't overcome its fear of reporting computer security incidents, citing a backlash from customers, shareholders and even lawyers who might respond to a publicized security problem by withholding trade, selling stock or bringing suit. But many of these fears are based on misunderstandings. For example, law enforcement agencies don't make cases public until there's an arrest. It's customers and hackers who make incidents public. Some fear any information shared with the government would be accessible through a Freedom of Information Act request. In reality, an existing exemption already protects records compiled for law enforcement purposes. Another concern is that crime fighters will take away computers during an investigation. Forensics does take time, but officials seize the perpetrator's equipment, not the victim's.

Change Management in Pharmaceuticals

By Stephanie Overby | 72

AS BIG PHARMACEUTICAL COMPANIES INTRODUCE new technologies to exploit human genome data and reduce the time and money it takes to bring drugs to market, they face a straightforward challenge: integration. For years, biologists, chemists and clinicians worked in relative isolation. Integration didn't occur among humans, let alone on a systems level. As Big Pharma makes the big move from an isolated environment to a collaborative one of digitized data and automated processes, the CIO is at the center of a change management maelstrom. The strategies being applied to achieve IT-scientist integration at Aventis, Eli Lilly and Pfizer include physically aligning IT staff with users, defining and codifying change management best practices, and protecting the risk-taking innovators from consequences of failure and publicizing their successes.

Petabyte Storage

By Fred Hapgood | 80

A PETABYTE IS EQUAL TO 15 ZEROS, which is sufficient to express Mexico's area in square inches. As companies' storage needs increase exponentially, many will eventually discover the world of petabyte storage. Such massive storage levels create applications that can retain and process vast amounts of visual data (especially data from video cameras), applications that provide simulations and predictive models, and apps that access networked devices such as counters, meters and switches. Management headaches come when searches conducted on larger volumes of data generate more errors. The costs of the core overhead tasks (like buffer management) will grow, and data quality will deteriorate as more space opens up. While some observers say petabyte storage is just not worth the hassle, optimists believe new technologies—such as systems that will automatically detect and resolve data conflicts—will keep petabyte problems of cost, error and time under control.

Grocery Retailing

By Susannah Patton | 86

WAL-MART, NOW THE LEADING U.S. GROCERY retailer with nearly 10 percent of the market, plans to increase its presence, as are other massive discounters like Target. Given the industry's razor-thin margins and disjointed systems accumulated through acquisitions, supermarket chains hoping to fend off Wal-Mart's incursion must improve supply chain technologies to cut costs and reduce out-of-stocks. Large and midsize chains are implementing wireless demand-driven replenishment and public exchange-based auctions. Manufacturers and retailers are using collaborative planning and forecasting. They are also pursuing customer loyalty programs (which Wal-Mart has avoided) and demand-based pricing, a sharp contrast to Wal-Mart's lowest price across-the-board philosophy. Some chains are even experimenting with biometric payment systems and radio frequency identification.



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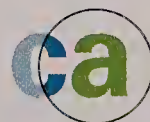
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Q&A continued from page 2

It is essential to set up specific event goals and objectives and a way to measure the success of an event. Are you trying to build brand affinity? Do you have lead generation goals? Be sure to include a "call to action" or information collection mechanism in your presentation or information display.

Set the criteria beforehand by which you will judge the success or failure of an event. And communicate your measurement metrics to the producing company so they can help you measure and meet your goals. An event is only successful for the producing company if sponsors and attendees want to come back.

Q. Why are CIO Executive Programs such a unique and powerful investment for IT marketers?

A. We are committed to being the definitive IT executive resource for our sponsors. This starts by having a vested interest and understanding of their goals, objectives, challenges—what keeps them awake at night. We are in the business of helping our customers do business by providing them with impactful, integrated opportunities designed to improve their ability to grow market share and

be profitable.

At the most basic level of providing brand awareness, building brand affinity and lead generation, the intimate setting provided by Executive Programs offers sponsoring companies multiple face-to-face opportunities with attendees, building their relationship in a highly focused and progressive manner. Because IT investment decisions will continue to be made at the CIO-level, the need to establish an enduring relationship is essential. In that light, the investment to participate becomes modest when compared to the buying power CIO Executive Programs attendees yield.

Q. What does Executive Programs have on the horizon?

A. While most event producers are cutting back on their events, we are in the unique position of adding events—specifically CSO Perspectives which debuts in June 2003—which correspond to our recently launched CSO (Chief Security Officer) magazine. CSO magazine, its companion website www.CSOonline.com and Executive Programs will provide security executives—and the marketers who need to reach them—with resources to address security on both a management and technology level.

CIO EXECUTIVE PROGRAMS

ATTENDEE PROFILE

Average IT Budget: \$156 million

Average Annual Company Revenues: \$5.2 billion

Purchase Involvement: 98% of CIO Executive Program attendees are personally involved in the acquisition of IT products and services

Executive Titles: 91% of attendees are CEO, COO, CFO, CIO, VP, Director or Manager titles

2003 CALENDAR OF EVENTS

CIO Enterprise Value Retreat & Awards
January 26–28, 2003
Marriott Desert Springs Resort & Spa
Palm Desert, CA

CIO Perspectives
April 27–29, 2003
Hyatt Regency Coconut Point
Resort & Spa
Bonita Springs, FL

CIO-100 Symposium & Awards
August 17–19, 2003
The Broadmoor
Colorado Springs, CO

CIO Perspectives
November 2003
Location TBD

To learn more about becoming a CIO Executive Programs sponsor, contact John Amato, Director of Executive Program Sales at 508.935.4487 or jamato@cxo.com.

CIO Reader Profile continued from page 2

CIO Readers and Technology Business Decisions

One hundred percent of CIO subscribers are involved in the technology purchase process within their organizations. And, their scope of involvement extends throughout the enterprise.

84% of CIO subscribers have IS purchase authority over the entire enterprise, departments, and/or divisions at their organizations. 56% of CIO subscribers have IS purchase authority over their entire enterprise.

Reader Affinity

CIO subscribers are engaged with CIO,

spend their valuable time with the publication, and pass along the publication or items of interest from it to their colleagues.

75% of CIO subscribers read the magazine on a regular basis (read at least 3 out of every 4 issues).

The average subscriber spends more than an hour (67 minutes) reading each issue of CIO.

And 56% of CIO subscribers either save the entire issue of CIO after they are finished reading it, or clip and save items of interest.

Methodology: The 2002 CIO Reader Profile study was conducted by Mediamark Research, Inc. (MRI), an independent research firm. Questionnaires were mailed to a random sample of 1,500 CIO subscribers. A total of 483 completed questionnaires, representing a 33% response rate, were returned to MRI by July 2002.

CIO Reader Snapshot

Mean HH Income: \$204,900

Mean Personal Income: \$164,000

Average Age: 45

Gender: 86% male /14% female

Education-College degree or higher: 89%

For complete study results, more information on CIO readers or a 2003 media kit, contact your CXO Media sales representative.

What's New at CXO Media Inc.

Publisher of CIO and CSO Magazines, CIO.com, CSOonline.com and Darwinmag.com

Reporters' Resource: What You Need to Know About Security

Created and distributed by *CIO* and *CSO* (Chief Security Officer) magazines, *Reporters' Resource: What You Need to Know About Security* covers all the hot security topics. Featured interviews include Bill Boni, Motorola's security chief, on balancing security needs with corporate funding restrictions; Richard Clarke, White House cyberspace czar, on the National Strategy to Secure Cyberspace; and Robert Weaver, Secret Service e-crime expert, on cyberattack trends and patterns. Additional resources include: groundbreaking research with more than 1,000 Security Executives on emerging trends and the scope of their responsibilities; five important developments to watch; key contacts and resources; and a glossary of acronyms and terms. *Reporter's Resource: What You Need to Know About Security* can be accessed online at CSOonline.com/reporters/resource.

This *Reporter's Resource* will help you get up to speed quickly on the fast changing security market and the emerging role of the CSO. To get your printed copy, contact your CXO Media sales representative.



UPCOMING CIO MAGAZINE EDITORIAL CALENDAR

Issue Date	Closing Date	Featured Topic
Dec. 1	Oct. 23	Web Business
Dec. 15/ Jan. 1	Nov. 6	Year-End Special Issue
Jan. 15	Dec. 16	Collaborative Computing IT Value
Feb. 1	Jan. 2	Annual Enterprise Value Awards Issue
Feb. 15	Jan. 16	Enterprise Systems Leadership Development

CSO Magazine Debuts



CXO Media is pleased to announce the launch of our new publication—*CSO* magazine available in print and online. In business and in government, inadequate security puts people, assets and valuable data at risk. *CSO* provides security executives with high-level information, best practices and strategic insight, helping them balance the safety of their enterprise with the pursuit of business opportunity. Through an integrated suite of products, including *CSO* magazine, its companion website, CSOonline.com, and face-to-face executive programs, *CSO* focuses exclusively on the information needs of Chief Security Officers. To learn more about *CSO* magazine and to read the premiere issue online, go to www.CSOonline.com, or contact Bob Bragdon, publisher, at 508.935.4443 or bbragdon@cxo.com.

CXO Sales Team is Growing To better serve our customers, CXO Media continually invests in the growth of our sales organization across the country. These individuals are ready to help you develop your integrated marketing plans.

John Amato has joined CXO Media as Director of Sales for Executive Programs. Based in Framingham, MA, John can be reached at 508.935.4487 or jamato@cxo.com.

Rhonda Goodman has joined our Eastern sales office as advertising sales associate. She can be reached at 973.244.4033 or rgoodman@cxo.com.

Chris Nolan has joined our North Central sales office as senior regional sales manager. He can be reached at 847.441.5005 or cnolan@cxo.com.

Sharon Patrick has joined our Eastern sales office as advertising sales associate. She can be reached at 973.244.4037 or spatrick@cxo.com.

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